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THE SPECIAL FIELD OF NEUROSURGERY*

BY

GEOFFREY JEFFERSON, M.S., F.R.C.S.

Honorary Neurological Surgeon, Manchester Royal Infirmary; Honorary Surgeon, National Hospital, Queen Square, London

When I come to speak of something so Rosicrucian to the general surgeon as neurosurgery I have to remember that although a man has lived ardently for his work what he has to say may yet be very tedious; it should none the less be possible to make some contacts with general interest. This last is no longer so certain as it may well once have been, for specialization has ruined the communal interest of scientific meetings. Or so it seems. Yet it is probably true that at all stages of human advance only a small part of the audience has been willing both to listen and to understand. There must have been folk more interested in astrology than in pharmacology, more interested in elecampane and hellebore than in the circulation of the blood, more interested in the diatheses than in the cellular theory of pathology, in the comforting properties of castor oil and poultices for abdominal pain than in newfangled notions concerning the relationship of perityphlitis to appendicitis. To many in such groups the modernists must have seemed to be cranks, hare-brained folk, later to be called specialists. It has been said that the essence of scientific investigation and of orderly advance is the formation of a vocabulary. And since advances in each special line soon lead to discoveries that must have new names attached to them, symbols by which they can be identified, and since criticism commonly suggests a new and perhaps a better name for the same thing, it becomes difficult before long for the other man to keep track of what is going on in fields outside his own. Not only that, but if he is deeply interested in what he is doing he will be too much engrossed in helping to invent new symbols to bother his head overmuch with the work of others. In neurosurgery these difficulties are specially apparent, but although it may seem to be going off on a track of its own its guide-posts are those which direct surgery generally. The fundamental principle is that for certain conditions surgery is the only therapeusis; but the surgeon is more than an operator, and nothing can prevent him from becoming deeply impressed by the clinical manifestations and the pathological natures of the states he treats, whatever organ they affect. The general surgeon has already proved this truth, the neurosurgeon is necessarily doing so, too, and is led thereby to pick his way as best he can through the neurological thickets.

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The Relationship of Surgery to Medicine

Every surgical specialty has had to fight its way out of the general body of medicine, and the spectators have generally agreed that it was an ill-looking brat, needing nursemaids, governesses, and godfathers in plenty, or it would surely come to a bad end. Few specialties have aroused such head-waggings and gloomy forebodings as has neurosurgery. But in this country at least it has not behaved as badly as was feared, and it shows so praiseworthy a tendency to be friendly to its nearest relations that it ought to be able to avoid the more flagrant mistakes. The close bonds between medicine and surgery are much more apparent in neurosurgery than in any other of the special fields. General surgery seems almost to have forgotten its beginnings, and for that matter it is not quite historically certain which broke away from the other. Surgery, as I have said, is based on the logic of certain pathological formulae which indicate that there are many conditions for which it is the only treatment. Nor is there, in general, any quarrel with the validity of this premise, though surgery has at times laid itself open, and will no doubt do so again in the future, to the charge of over-zealousness, a tendency to cure conditions which are not yet present or to intervene too impatiently before more conservative and possibly effective means have been given a fair trial.

It is sometimes held, on the ground of occasional mistakes of this order, that surgery would have done better never to have left the skirts of Mother Medicine, if that is what she was, and that true perfection can only be attained under her controlling hand. This assumes an omniscience on the one hand and a lack of intelligence on the other which everyday experience proves to be false. It is regretted by the diehards, for example, that the abdominal surgeon—that specialist who so often abrogates to himself the title of general surgeon, to the annoyance in particular of his orthopaedic brothers—has won independence, for he is now free to commit daily intra-abdominal intrusions from which a more cultured mind than his would recoil. Probably the worst that could truly be said would be to admit that enthusiasm does sometimes lead to well-intentioned errors, less often due to ignorance than to the insistence of patients who have revolted against the failure of such medical treatment as has been provided to bring about a cure.

But although none will deny that the closest co-operation with the physician and with the physiologist is not only a proper but a necessary ideal, the truth is that the surgeon's march is not so ataxic as armchair critics avow. The worth-while surgeon will always be something more than an operator; he would be wrong if he allowed himself to be persuaded into the belief that he was a machine, a manipulator, a technician—with just enough visual and motor cortex to lead him to the operating table and activated by conditioned reflexes when he got there. He should be absolved from such an indictment by the very nature of his daily work, for he is continually conducting humane experiments, though he may lose sight of this fact in the more human aspects of each case. While with animals we speak frankly of experiments, with the most expensive of them all we speak of experience—a distinction without much difference. Operations are so standardized to-day that their essentially experimental nature is no longer remembered; the ritual has been so often repeated that the result is apt to be regarded as a foregone conclusion. And yet every operation is a new one, an experiment, so far as each fresh individual is concerned. Percentages of success give important but always oblique data: they do not tell us exactly what will happen to the individual. The surgeon, whatever his work, is constantly building up new experimental facts, sometimes of no special interest except to himself, at other times of primary importance to medicine as a whole. Sooner or later he must become well versed in the physiology of disease and its variations. He will begin his work long before the patient reaches the table and continue as long afterwards as a follow-up is yielding knowledge. More than this, he will conduct his operations as well-planned interventions with a specific physiological end in view, in which something is to be done to an immensely valuable animal whose recovery is imperative. How, therefore, in the end can he avoid being a doctor as well as a surgeon? What I have been trying to say is that the surgeon cannot possibly be as ignorant as some critics avow, because the nature of his work gives him opportunities equal to those of the experimental laboratory, and even in defeat he should be able to wring contribution from disaster.

You may wonder that I should have thought it necessary to introduce the relationship of medicine to surgery as a whole, and especially to repeat criticisms. Within these walls I could well assume that surgery is sure to be inviolate, and that in a self-congratulatory body there would be no sound of an adverse voice against our own craft. It seems to me, rightly or wrongly, that it is better to show an awareness of our critics, and that we ought to do more than answer them by the very successful method of pretending that we have not heard what they said.

The Rise of Neurosurgery

Neurosurgery has been a late starter in the field of specialization, for it was but natural that the easier portions of the terrain should be explored first, and in those the rewards of knowledge have been considerable. Furthermore, the surgery of the nervous system was held back in the earlier days of surgical victories by lack of basic physiological knowledge. Thus the great triumphs of Rickman Godlee and, especially, of Victor Horsley were grounded not alone on the discovery that brain and spinal cord were operable fields technically, but upon the demonstration that tumours of these organs could be diagnosed and located in the living. Striving through improvement towards perfection (not yet attained) in this task, neurology has been aided by many: by experimental physiologists, very greatly by the neurological physician who has applied laboratory work to the human directly and indirectly, by the ophthalmologist, by the otologist, of recent years materially by the radiologist, and, not least, by the neurosurgeon himself. However, neurosurgery only became really attractive when two things were evident—first, that there was enough material to occupy a few men fully; and, secondly, that sufficient good could be done to make full specialization worth while. The latter should perhaps have come first, for continuous work in a medium leads to so considerable a bettering of the average performance that results become possible far beyond the reach of the occasional intervener in the neurological field. Those with the most limited experience are those most likely to be depressed, for reasons that will shortly appear.

We owe to the general surgeon in the main the tools by which the approach to a tumour is carried out. There is, however, a great difference between skull surgery and brain surgery, and while most general surgeons are reasonably good and some even brilliant skull surgeons, it is only after the dura mater has been exposed that the real operation begins. It is at this point that lack of specialized knowledge (either self-obtained or imposed) proves the stumbling-block. Even if the lesion has been correctly localized, how is a subcortical tumour to be found, how is it to be fully exposed, and, above all, how is its nature to be recognized so that a plan of action can be mapped out? It is the combination of these difficulties which has led the general surgeon to retire from this field in some despair, and sometimes with a feeling of the futility of the problem to offset his defeat.

I have the impression that the old idea of the uselessness of brain surgery—an idea certainly less widely held than it was a few years ago—was brought into being by operations on the glioblastoma. This tumour, which must rival the osteogenetic sarcoma of the long bones in its impossibility of surgical cure, is the easiest of all tumours to diagnose. It occupies for preference roughly the territory of the middle cerebral artery, involves or springs from the basal ganglia, and leads to a more or less rapidly increasing paralysis. It is a tumour affecting the middle-aged, often occurs without very apparent pressure signs, and is uniformly fatal. The march of an aphasia and a progressive paralysis with a rapid deterioration in the patient's well-being leads in a high proportion of cases to its ready recognition. We know to-day that operations on this type of tumour are futile, yet it is this type with which the surgeon has only too often been presented as his chief material. Were this to be all, neurosurgery would have been ended before it had well begun. The more benign tumours, on the other hand, are commonly much more difficult of recognition, and consultation between physician, surgeon, perimetrist, and radiologist may have been necessary before it is certain that a tumour even exists, let alone its precise localization known. Those with the fewest signs are usually the best cases of all. Before the neurosurgeon has won through to this type of case he will himself have had to become sufficiently cultured and sufficiently strong-minded to resist the temptation to prove his worth on impossible cases. Fortunately for neurosurgery there were three lesions that called for surgical attack, where the performances of the few were notably better than those of the general—trigeminal neuralgia, pituitary adenomas, and the acoustic neurinomas.

Tumour Variety and Sites of Election

Those without special knowledge are prone to believe that intracranial tumours all behave in the same way, that nearly all are gliomas, that gliomas are of uniform nature; and they picture the life of the neurosurgeon as a dreary round of opening the skull to attack incurable lesions. Nothing could be further from the actual facts. The neurosurgeon may even sympathize with his less fortunate brothers condemned to duller routines. There is no doubt that the results of brain tumour operations compare most favourably with those of tumours elsewhere in the body. I remember very well that when I started neurosurgery I began, as all at that time were compelled to do, with little preknowledge of what the tumour was likely to be. And as a result I did what I recognize now to have been a number of useless operations. The paralysed and comatose patient that I was expected to resuscitate was then, and still remains, a depressing subject for surgery. Furthermore, the medical and lay public, impressed with the results of abdominal emergency work, expected miracles that were not forthcoming, as is their way. The worse the patient the greater the need for immediate operation. One cannot quarrel with the superficial logic of this equation, but, confronted by a dehydrated, semi-starved, and toxic subject without a striking rise in intracranial pressure, I learned by painful steps to seek my operation material elsewhere. Close on eight years elapsed after my tentative entrance into this field before the first meningioma came along; for the ground had to be sown before it could be reaped, and the crop contained many weeds. A few suitable cases declined operation, fearing disaster. Only one pituitary tumour had been operated upon prior to the foundation of the Neurosurgical Service, and that many years ago. It was long before the conservatism of the ophthalmologists engendered by that case was overcome. Nowadays their co-operation is a most prized asset.

I vividly recall saying to a master of neurosurgery fourteen years ago that until we knew what and where intracranial tumours were with something like the precision of our knowledge of breast tumours, and could reasonably forecast the future of that tumour, we should not make much progress. It seems odd that that was such a short time ago, for during the years that have passed this knowledge has come very near indeed to achievement. New knowledge on the behavioural characteristics of intracranial tumours has vitalized neurosurgery. Scarcely had the operations of subtemporal and suboccipital decompressions become standardized and their technique established than they became of subsidiary importance in the realization that if operations are to be done at all they will have as their object the extirpation of the lesions (a generalization with few exceptions). It is not only on the histological side that knowledge of intracranial lesions has altered, but, thanks to the reviews of Van Wagenen and Cairns on Harvey Cushing's material, their life-history has become known. These results were the more readily accepted because they corresponded with the trend of survival in the records of surgeons whose material was neither so extensive nor dated so far back as Cushing's. Thus it emerges that the cerebellar astrocytoma is the most benign of all the gliomas and is, happily, a fairly common tumour in the young. And so my second longest surviving glioma patient had one of this type in the cerebellum, operated upon in 1924 at the age of 10, and now, after a second operation in 1932, is a healthy young woman of 24. The longest survivor is a 23-year-old, first operated upon by Mr. Rayner at the age of 2, and though I have never been able at repeated attempts to remove the whole of this boy's tumour, its slow evolution is evidenced by its duration for twenty-one years at least. The long history of some gliomas (seventeen, fifteen years, and so forth in my own series) is a fitting subject for longer comment than can be given it here. Next would come the ten-year and less survivals (with many still living) of meningiomas, acoustic neurinomas, pituitary adenomas, haemangioblastomas, and so forth. It is clearly among this type of tumour that surgery has its best opportunities.

It has become increasingly clear that tumours in certain locations tend commonly to be of certain types, and that there is in a wide sense a connexion between site and structure. This is particularly clear in the case of the cerebellar tumours, where certain types are proper to certain age groups, and where the symptomatology varies with tumour type (acoustic neurinomas, astrocytomas, ependymomas of the fourth ventricle). It has become as a consequence easier to write and talk about tumours according to their nature than to give a global view of focal symptomatology. The syndromes of certain regions, whatever they may be, are conditioned to an appreciable extent by the histology and life-history of the tumour, by its tendency to cut neuronal connexions or only to push them aside. At times signs may be negligible, at others so gross that the picture of a major neurological disaster is recognizable to the least-informed observer. The latter picture is most often presented by the highly malignant and invasive tumour (the glioblastoma) and to a scarcely less extent by the cellular astrocytomas. The glioblastoma represents about one-third of the glioma group and roughly one-tenth of the neurosurgeon's work. The more benign gliomas make up a considerable total, with the very slowly growing at one end of the scale and those with malignant tendencies at the other. The difficulties here lie not so greatly in the inherent tendencies of the tumour as in its extent and position. A benign glioma that infiltrates the motor area or the chiasma, for example, is one which cannot be properly attacked radically.

Material

Let us now turn to the material which has come into my Service. The cases are analysed in Tables I and II. I will begin with the neuralgias.

TABLE I

Neuralgias to October, 1938:

Trigeminal (total interventions, 746):	
Root sections	277 (2 deaths)
Peripheral injections	376
Ganglion injections	93 (mainly by anterior route)
Glosso-pharyngeal Neuralgia (5 cases):	
Intracranial division of ninth nerve	5 (+1 divided in neck)
Mortality, 1 (male aged 73)	

Vertigo (Ménière's Disease):

Sections of the eighth nerve intracranially for vestibular crises	16 cases
Mortality, nil	

The plan with the neuralgias has been to operate upon those with pain in divisions two and three, some where it was in one and two, but when it affected all three divisions to inject the ganglion by the Hartel technique, introduced and perfected in this country by H. H. Rayner and Morris. The many peripheral injections are evidence of the belief that it is well to give a preliminary injection first to accustom the patient to numbness. Moreover, the pitiable state of many of these sufferers calls for some treatment that can be given at once. Many more sensory-

root operations would have been carried out had it not been for the pressure on in-patient accommodation by tumour bearers. The figures in Table I are self-explanatory.

TABLE II.—*Analysis of 1,000 Cases*

1. Gliomas			365
2. Meningiomas			110
3. Pituitary adenomas			117
4. Acoustic neurinomas			70
5. Congenital cysts:			
Pituitary	22		
Third ventricle	2		
Meningeal	9		48
Epidermoids	15		
6. Vascular tumours:			
Angioma cerebri	10		
Cerebellar haemangioblastomas	17		27
7. Intracranial aneurysms			48
8. Tuberculomas			38
9. Syphilitic lesions			4
10. Chiasmal gliomas			7
11. Pseudo-tumour:			
Serous meningitis	33		
Chiasmal arachnoiditis	10		58
Occlusive meningitis	15		
12. Metastatic tumours			20
13. Cerebral abscess			45
Not histologically verified			43

There were at the same time 58 primary tumours of the spinal cord, its roots, or membranes.

Intracranial Lesions

Space will not permit of detailed analysis of the foregoing list of the intracranial lesions which form the main body of the neurosurgeon's work. A certain number of gliomas have been omitted because the patients died immediately after admission or were in too bad condition to allow of surgery. One important thing must be said on this point: that a most careful evaluation must be made to decide whether a very ill patient is so because he has (*a*) an invasive destructive lesion, or (*b*) a benign one with general high pressure. It is only the latter group which are worth considering surgically. And it should be added that once a patient is known to have a tumour a waiting policy, for fear of possible operative fatality, is the surest way to bring about that result. A degree of high pressure may develop which will invalidate attempts at removal later. To make a comparison, it is generally held that the results of extirpation of carcinoma of the colon would be brilliant were it not for the high mortality introduced by obstruction. In neurosurgery the results would be even better were the pressure problem to be eliminated by very early diagnosis. Certainly the easiest cases are commonly the safest, and the greatest measure of safety can only lie in early intervention. Best of all, therefore, a benign tumour before pressure has introduced such technical difficulties into the picture that no proper exposure of the tumour, much less its removal, can be accomplished. We cannot, unfortunately, cause our patients to have the kind of tumour that we would wish to find, but we should be able to recognize its type and to use a wise discretion as to what to do and when, and to learn, above all, when to do nothing.

What mortality can be expected? This is a vexing question: mortality can be kept at a very low level by refusing to take risks. We may well sympathize with J. B. Murphy, who refused the condolences of his wife on some fatalities by saying that he ought to have been a good enough surgeon to know that the patient would die if he operated. Most of us know what Murphy felt, but we have equally to beware of timidity that may work to our patients' disadvantage. But if we have some figure, such as 10 per cent., to aim at it may help us at times to resist man's itch to achieve the impossible. During the last twelve months there have been 140 major operations for intracranial tumour on 125 patients, with fifteen deaths—an operation mortality of 10.7 per cent. and a case mortality of 12 per cent. (pituitary adenomas fifteen cases, no deaths; congenital cysts ten, two deaths; meningiomas eighteen, two deaths, twenty-four operations; tuberculomas four, no deaths; acoustics nine, two deaths from pneumonia; gliomas sixty-nine, nine deaths). One meningioma had four operations in a futile attempt to extirpate a large tumour straddling the wing of the sphenoid.

The tables give some idea of the perspective of neurosurgical work. The awakening of interest in the subject seems to ensure that it will increase rather than diminish, and most of us are hard put to get through our work. Neurosurgery has a reputation for long and arduous sittings; but one has to make a choice, and I have made mine. The spectacular operator went out of fashion with the invention of anaesthesia, and in his place have come men of a less dramatic school. There is such a thing as style in operating: some people look better, others worse, than they really are. We all know the apparently poor technician who gets such good results, and feel that something is wrong there. But we remember that more important than what the surgeon does with his hands is the quality of mind which he brings to his task.

AN UNUSUAL CASE OF LEAD POISONING

BY

G. E. BEAUMONT, D.M., F.R.C.P.

Physician to Middlesex Hospital

AND

R. WYBURN-MASON, M.B., B.Chir.

Late House-physician to Middlesex Hospital

This case presented the unusual combination of fever, severe abdominal pain, vomiting, jaundice, and epileptiform fits associated with temporary blindness.

Clinical Record

Previous Illnesses.—The patient, a railway signal clerk aged 16, living at Crawley, Sussex, had a history of frequent attacks of abdominal pain, vomiting, and jaundice since childhood, resembling the present one but not so severe. For this reason his appendix had been removed four years previously, without benefit. In 1927 he had pneumonia, followed by empyema with rib resection. No previous history of fits was obtained.

Family History.—There was no family history of epilepsy. His elder brother had suffered from one attack of jaundice, and his sister had had a mild attack similar to our patient's about three years previously, since when she had not lived in the same cottage.

Present Illness.—On May 28, 1938, he collapsed while going to work, with general malaise, sleepiness, and severe central abdominal pain. His doctor found nothing abnormal except slight icterus and a temperature of 101° F. The patient remained in much the same condition for a week, with a temperature ranging from 99.2° to 100° F. He then gradually improved and the temperature fell to normal in about eighteen days from the onset, when he was allowed to get up. He was constipated throughout the illness, and his appetite was very

poor. A blood count on June 30 showed: red cells, 3,400,000 per c.mm.; haemoglobin, 58 per cent.; colour index, 0.8; white cells, 4,700 per c.mm. On July 11 the patient was again seized with violent colicky abdominal pain. He vomited bile, was irritable, complained of a feeling of heaviness and weakness in the legs, and began to lose his sense of direction. He was very constipated, and again was slightly jaundiced. His motions were normal in colour. He became drowsy and difficult to rouse, and on July 15 he had three epileptiform fits at intervals of approximately two hours. These were followed by a severe headache, and he rapidly became blind. He was admitted to the Middlesex Hospital that evening under our care, and had four more fits that night in a period of six hours.

Examination on Admission.—The patient was pale, the skin of a greyish hue, and the conjunctivae slightly icteric. Cerebration was slow and he was difficult to rouse. The pulse was regular, 100; temperature, 99.6° F.; respiration, 16 and Cheyne-Stokes in character. The blood pressure was 145/122 mm. Hg. The teeth were very good, and no blue line was seen on the gums or cheeks. The pupils were widely dilated, but reacted fairly briskly to light and accommodation. The fundi were normal; no papilloedema was present. Vision was limited to light perception only. The knee-jerks and ankle-jerks were brisk; the left plantar response was extensor and the right one was not obtained. (The patient had had a fit a short while previously.) The left upper abdominal reflex was absent. The specific gravity of the urine was 1020. Bile pigments were present, but there were no bile salts, albumin, or sugar. While being examined the patient had an epileptiform attack, which began by his head and eyes turning to the right; his left hand then moved to his face and became rigid. He said, "The attack is coming on." His eyes and head now turned to the left, the arms crossed over the chest, and the whole body went first into tonic and then into clonic spasms. The pupils were dilated and inactive to light. The clonic stage passed off suddenly after about two minutes; the patient micturated, and remained unconscious for about ten minutes. Three more fits occurred during the night, all of the same character.

Course of the Illness.—July 16, 1938: The temperature was 97° F. in the morning, 98° at 6 p.m., and 101.4° at 10 p.m. There was no fit after the one at 2 a.m. Vision was still limited to light perception. Reflexes were now normal, except that the left plantar response was absent. Lumbar puncture showed the fluid under increased pressure of 270 mm. H_2O. This was lowered to 150 mm. by running off some fluid. Examination of the fluid showed 0.03 gramme of protein per cent. and 7 lymphocytes per c.mm. The Lange curve was normal and the Wassermann reaction negative. An enema gave a dark constipated result. Urine (twenty-four hours' volume), 22 oz.

July 17: The temperature was now normal, and remained so. No more fits occurred. Blood pressure, 130/105 mm. Hg. Urine (twenty-four hours' volume), only 14 oz. The urine was sent for analysis for lead.

July 18: Much improved. No vomiting, no abdominal pain, and sight returning. He could now recognize faces. Urine (twenty-four hours' volume), 13 oz. Blood pressure, 115/85 mm. Hg. The bowels were opened naturally. Lumbar puncture showed a clear fluid, with a pressure of 180 mm. H_2O. This was reduced to 150 mm. by drawing off cerebrospinal fluid.

July 19: Condition improving. Urine (twenty-four hours' volume), 38 oz.

July 20: The sight was now nearly normal. A sudden diuresis began and continued for six days; this period coincided with a fall of the blood nitrogen to normal (see investigations below). Urine (twenty-four hours' volume), 89 oz.

July 21: Urine (24 hours' volume), 93 oz. July 22: The patient was allowed up; urine (24 hours' volume), 73 oz.; blood pressure, 115/75 mm. Hg. July 23: Urine (24 hours' volume), 53 oz. July 24: Urine (24 hours' volume), 77 oz. July 25: Urine (24 hours' volume), 62 oz. July 26: The patient felt quite normal; the icterus had disappeared; urine (24 hours' volume), 62 oz.

On September 4 the patient was discharged to a convalescent home, having gained 10 lb. in weight since admission and being free from all symptoms.

Special Investigations

The urine on July 16 contained a few hyaline casts, and red and white cells were present. There were no tyrosine or leucine crystals. On July 17 lead was found to the extent of 1 part in 10,000,000 parts of urine. This is considered diagnostic of lead poisoning.

THE BLOOD

On July 16 a blood examination showed: red cells, 4,700,000 per c.mm.; haemoglobin, 92 per cent.; colour index, 1; white cells, 11,000 per c.mm.—neutrophils 73 per cent., lymphocytes 19 per cent., monocytes 8 per cent. Three stippled cells per 100 leucocytes were present. This blood count suggested the diagnosis of lead poisoning. On August 5 the count gave: red cells, 4,800,000 per c.mm.; haemoglobin, 95 per cent.; white cells, 9,100. No stippling was seen.

Fragility of Red Cells.—The curve showed decreased fragility.

Van den Bergh Reactions.—July 16: Direct biphasic, positive; indirect, positive; quantitative = 7 units bilirubin. August 5: Direct delayed, faintly positive; indirect, faintly positive; quantitative = 1 unit bilirubin. September 1: Direct delayed and indirect, negative: quantitative = less than 0.5 unit bilirubin.

Wassermann Reaction.—Negative.

Alkali Reserve.—July 16: 61 c.cm. CO_2 per cent.

Blood Urea and Non-protein Nitrogen:

July 16:	Blood urea	..	70	mg. per	100 c.cm.
	Non-protein nitrogen	..	51	" "	"
July 21:	Blood urea	..	56	" "	"
	Non-protein nitrogen	..	46	" "	"
July 27:	Blood urea	..	41	" "	"
	Non-protein nitrogen	..	33	" "	"

There was no evidence of lead in the limb bones. Radiographs of the chest, head, and abdomen were normal.

Results of the Investigations

The conclusions drawn from the investigations were that: (*a*) lead poisoning was present, as shown by the stippling of the red cells and the lead in the urine; (*b*) the temporary retention of nitrogen in the blood coincided with the period of oliguria and disappeared with diuresis; (*c*) there was no evidence of nephritis; (*d*) the temporary excess of bilirubin in the blood was due probably to haemolysis, which would account for the slight icterus; (*e*) increased intracranial pressure was present, but there was no evidence of meningitis; (*f*) the decreased fragility of the red cells is the opposite to what occurs in acholuric jaundice; and (*g*) the anaemia was temporary.

When lead poisoning was diagnosed as the result of the clinical findings, blood film, and urine analysis difficulty was experienced in tracing the source of the poison. There was no history of occupational risk other than the presence of lead storage batteries under the signal-box where the patient worked. Further, he had worked there for a short time only. Inquiry into the water supply of the patient's home elicited the fact that the water was obtained from a well by pumping through lead pipes. The first sample of water analysed showed no trace of lead. It was then found that this had been obtained after a free pumping. Analysis of a second sample, obtained after allowing the water to stand in the pipes, showed 4 parts of lead in 10,000,000 parts of water.

Treatment

The patient was first treated with milk, four pints in the twenty-four hours, glucose, and calcium lactate 30 grains thrice daily, with the idea of removing the lead from the circulation to the bones. After the acute symptoms had subsided an attempt at "deleading" was begun on August 6 by means of a low calcium diet and the intramuscular injection of 50 units of parathormone daily. The urine collected from August 6 to 8, however, contained no lead.

Discussion

The clinical diagnosis was obscure for certain reasons:

1. *Suggested Intestinal Infection.*—The febrile illness of eighteen days' duration with abdominal symptoms and slight jaundice suggested some intestinal infection. The temperature in the toxic crises of lead poisoning rarely rises 1° F. above normal (Aub *et al.*, 1926). The pyrexia could not be due to the fits, as no fits had occurred for more than twenty hours before the sudden rise to 101.4° F. on July 16. Thus it appears that the temperature was due to an intercurrent infection. Further, latent cases of lead poisoning may be unmasked by intercurrent infection (Shie, 1921). It is therefore possible that the exciting cause of the toxic episodes in this case of chronic lead poisoning was an infection. The previous similar attacks, for which the appendix was removed, were probably toxic episodes of lead poisoning also.

2. *Possibility of Uraemia.*—The oliguria and raised blood nitrogen suggested the possibility of uraemia, accounting for the fits and amaurosis; such attacks are, however, usually considered to be due to hypertensive encephalopathy, and the blood pressure was not high enough in this case to cause vascular spasm. The urine did not suggest evidence of renal damage, as there was no albumin, and only a few hyaline casts were found. Furthermore, as the urine output increased the blood nitrogen fell to normal. It therefore appears probable that the increased blood nitrogen and the oliguria were due to the effects of the lead, causing vascular spasm and diminishing the blood supply through the kidneys. There was no evidence of uraemia. Oliguria with a rise of blood nitrogen during the abdominal crises of lead poisoning followed by a diuresis and fall in the blood urea has been described by Achard and Leblanc (1914) and Mosny and Javal (1914). These changes cannot be due to renal arteriosclerosis, since they occur even after a short exposure to lead; nor can they result from nephritis, because the urine contains no albumin and no casts. Moreover, the patients do not subsequently develop renal lesions if the exposure to lead ceases. Continued exposure to lead is liable to result in chronic nephritis, possibly owing to prolonged vascular spasm. There is no evidence that the raised blood urea is due to excessive tissue breakdown, as there is no wasting, loss of weight, or pyrexia, and this would not explain the oliguria. Mosny and Javal (1914) compare the condition in lead poisoning with that of calculous anuria, in which there is an enormous azotaemia which disappears when the obstruction is removed, and they suggest that there is a reflex inhibition of the kidney function. This inhibition in lead poisoning we suggest is due to vascular spasm, resulting in oliguria and failure of elimination of nitrogenous products in the urine.

3. *Fits.*—These are manifestations of lead encephalopathy. This has been attributed (Aub *et al.*, 1926) to various causes, such as:

(*a*) *Cerebral Arteritis and Arteriosclerosis.*—These lesions have not been demonstrated at necropsy.

(*b*) *Punctate Cerebral Haemorrhages.*—These also have not been found post mortem.

(*c*) *Direct Action of Lead on the Cortical Cells of the Brain.*—Lead is present in small amounts in the brain, but no macroscopic or microscopical changes are seen, except some evidence of anaemia in the grey matter.

(*d*) *A Meningeal Lesion.*—The pressure of the cerebrospinal fluid is often raised, as in our case. Hassin (1921) states that at necropsy proliferative meningitis with some round-celled infiltration is present, but the brain changes are slight. Experimental injection of lead salts into the cerebrospinal fluid causes excitement and convulsions in dogs, but if the injection is made direct into the brain the only lesion found is a slow necrosis of the surrounding brain tissue. Intravenous injection is said not to cause encephalopathy. Mosny and Malloizel (1907) and others record an increase in the lymphocyte content of the cerebrospinal fluid in lead encephalopathy up to 100 lymphocytes per c.mm. The normal protein content of the cerebrospinal fluid and the very slight increase in the cell count in our case suggest that meningitis was not present. The increase in the pressure of the cerebrospinal fluid might be secondary to cerebral spasm followed by oedema.

(*e*) *Uraemia.*—This theory implies the occurrence of hypertensive encephalopathy, and has been discussed above and discarded.

(*f*) *Cerebral Anaemia.*—This appears to be the most likely cause. Arterioles placed in solutions of lead salts contract (Siccardi and Dozzi, 1914). Aub *et al.* (1926) state that vascular spasm leading to cerebral anaemia cannot be the cause of the fits, since there is no general rise in the blood pressure. In our case there was a slight but definite rise, which, combined with the local action of the lead on the capillaries, would possibly be sufficient to cause vascular spasm, cerebral anaemia, and oedema. This would explain the focal nature of the epileptiform discharges and also the raised cerebrospinal fluid pressure.

4. *The Amaurosis.*—Visual disturbances are well recognized in lead poisoning, especially optic neuritis, optic atrophy, retrobulbar neuritis, and hemianopia. The acute onset of blindness, with an equally rapid disappearance, suggests that no organic lesion could be present in the fundus or optic nerve connexions. The amaurosis might be due to retrobulbar neuritis, but the blotting out of the peripheral and central fields of vision, the response of the pupils to light and accommodation, and the rapid restoration of vision suggest that the lesion was situated in the visual area of the occipital cortex. It could be explained by local spasm of the vessels with some associated oedema, due to the action of lead on the vessels and associated with some rise of the blood pressure, which fell again as sight was recovered.

Conclusions

The encephalopathy, transient blindness, oliguria, and raised blood urea associated with abdominal pain can all be explained by the action of lead on plain muscle, causing it to contract. The anaemia and slight jaundice result from haemolysis.

Summary

The clinical record of an unusual case of lead poisoning is presented, with an account of the investigations made.

The results of these investigations are given, together with the conclusions drawn from them.

The reasons for the obscurity of the clinical diagnosis are discussed.

Dr. Sidney Matthews, who arranged for the admission of the case to Middlesex Hospital, kindly supplied us with the

details of the patient's family history and his condition before arrival in hospital and with specimens of water for analysis. He told us that the water came from a well, from which it was carried to the sink by a lead pipe. We wish to express our thanks to the special departments of the hospital for help in the investigations.

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A PLEA FOR THE FREER USE OF BLOOD TRANSFUSION IN OBSTETRICS

BY

JOHN STALLWORTHY, M.B., Ch.B., F.R.C.S., M.C.O.G.

First Assistant, Nuffield Department of Obstetrics and Gynaecology, University of Oxford

One woman dies every day in England and Wales from haemorrhage in childbirth. This statement is based on figures supplied by the Registrar-General, and takes no account of those deaths from sepsis in which anaemia is a contributing factor. When the frequent morbidity due to post-abortal and puerperal anaemia is remembered, the importance of haemorrhage in pregnancy is still more striking. The annual death roll from this cause in America has been assessed at 1,500 and in Germany at 400. There is a tendency to believe that deaths from haemorrhage occur in those parts of the country in which obstetrical and surgical facilities are not so readily available as in most of the large centres, but an evening spent in reading the annual reports of obstetrical hospitals will convince any reader that this is not correct. He will be surprised by the number of deaths occurring directly from haemorrhage, and still more will he be surprised to find how seldom an attempt was made in these cases to restore the blood loss even in circumstances which might be considered ideal from the point of view of treatment and facilities.

Although so many articles have been published in recent years on the subject of blood transfusion its importance is still not fully realized. Public opinion would be shocked if 100 passengers on a liner were drowned simply because lifeboats available were not used; but when, in England and Wales alone, over three times this number of women die annually from obstetrical haemorrhage there is a tendency to regard the loss as inevitable, and insufficient vigour is displayed in organizing the facilities available that these deaths may be prevented.

It is not within the scope of this paper to discuss the great importance of prophylaxis in obstetrical haemorrhage. It is fitting, however, to draw attention to the fact that many of the most severe haemorrhages are preceded by some significant warning. Thus, preliminary small losses often announce the presence of a placenta praevia, and it is courting disaster in such cases to wait for a severe haemorrhage before grouping the patient and arranging for compatible donors. The case in which there is doubt as to the advisability of a transfusion is not under discussion. The value of saline, glucose saline, or gum infusion has been stressed on many occasions, but when blood loss has been extreme it is well to remember that the effect of these remedies is fleeting and that lasting benefit comes only from replacement of blood. The exsanguinated patient may revive after saline infusion, but, as already indicated, the annual death roll is increased by the many who do not. These are the cases I now wish to discuss.

Solomons (1938) in an article on tubal pregnancy made the following arresting statement:

> "Blood transfusion was not employed for any patient. . . . Patients have been killed by venous transfusion in this condition and in others, and at this stage I should like to utter a warning against indiscriminate blood transfusions and to emphasize the value of submammary and rectal saline, glucose, and coffee. The ambulatory intravenous services suggested in England and in other places have done and will do harm, even though they will be occasionally useful."

In spite of the excellent results Solomons reported in his series of 214 cases without a death, his words cannot be allowed to pass unchallenged. To discuss fairly the dangers of blood transfusion it would be necessary to consider the pathology of those conditions for which it has been advocated and used. Such a discussion would also embrace the question of age, blood volume, and other factors which are not relevant to this paper. It is sufficient to state that transfusion in cases of severe blood loss due to acute haemorrhage during the age period with which this paper is necessarily concerned is justified by theory and its value established by practice. In an extensive experience of such transfusions I have seen no disasters.

Fatal Cases following Blood Loss

Those who subscribe to the views stated by Solomons must find it difficult to explain the many cases recorded annually in hospital reports in such words as the following:

> "She was admitted to hospital at 12.10 a.m. on May 17 with a retained placenta. She was in an extremely shocked condition and had had a very severe intra-partum haemorrhage before admission. On admission she was still bleeding profusely. A light anaesthetic was given and the placenta manually removed. An intravenous gum saline was then given, but the patient never rallied, and she died soon afterwards."

> "Immediately following the delivery of the placenta brisk post-partum haemorrhage occurred, which responded well to ergometrine intramuscularly and hot intra-uterine douching. Following this the patient's general condition was poor, her blood pressure was 80/56, and her pulse almost imperceptible at the wrist. However, after the administration of 100 c.cm. of 50 per cent. glucose solution intravenously and morphia grain ¼, raising the bed, and bandaging the limbs, her condition improved remarkably and remained satisfactory for three hours, when she suddenly collapsed and died."

> "The patient was delivered spontaneously of a living child which had presented by the breech, and satisfactory analgesia was obtained with the Minnitt apparatus. A severe post-partum haemorrhage followed, and manual removal of the placenta was performed under general anaesthesia. In spite of treatment she died from haemorrhage two hours later."

These examples from three recent separate reports might be multiplied many times.

All who have had experience of the effects of transfusion on patients who are exsanguinated will testify to the dramatic improvement it produces in most cases. One may ask why, if this is true, transfusion is not used more often in emergency cases. The answer is that in hospitals resident medical officers are frequently not "transfusion minded" and regard the giving of blood as a difficult and laborious procedure. For this attitude of mind the respon-

sibility must ultimately be accepted by the honorary staff. In private practice the belief is widespread that transfusion demands resources beyond the scope of the traditional black bag. Even if this belief could be justified in the past it certainly cannot be now, since the introduction of such simple and excellent apparatus as the "vacoliter" and similar transfusion sets.

Emergency Transfusion

If a reduction is to be made in the number of deaths from haemorrhage it is essential that in all institutions in which obstetrical and gynaecological cases are treated emergency transfusion apparatus should be available at a moment's notice. It is of equal importance that the nursing staff and medical officer in charge should be familiar with the apparatus and able to assemble and use it without delay. For this to be done effectively in institutions in which the resident staff is constantly changing there must be some co-ordinating control by a permanent member of the staff. To return to the analogy of the liner and the lifeboats, the latter can be effective in an emergency only if passengers and crew alike have been previously instructed as to their individual stations and duties. Transfusion drill in an institution is not essential, but, if irritating and perhaps costly delays are to be avoided, it is necessary that the equipment should be inspected periodically and maintained in first-class condition.

Technique

In the type of case under discussion a drip transfusion set is undoubtedly the best. With it a glucose saline can be given while suitable blood is being obtained, and then without further manipulation the latter can be supplied at any desired rate of flow. To facilitate the adjusting of blood levels in the dripping chamber, and to provide an easy means of emptying the main container of saline before adding blood, a dripping chamber with a side arm (Fig. 1) is of great advantage. The argument as to whether to insert a needle or to tie in a cannula does not arise, because in the emergency cases under discussion the latter method is usually necessary and therefore always advisable. The vein will be found collapsed and often in apparent spasm. In such a case it is sometimes best to cut straight across the vessel, after which the contracted lumen is easily seen. While the cannula is inserted the wall of the vein can be steadied with fine mosquito forceps, two pairs of which are invaluable in any transfusion set. On occasions venous spasm or collapse is so pronounced that it is necessary, at the start of the transfusion, to supply the blood under pressure. With improvement in the general condition of the patient the blood flows more easily. The choice of a vein is one of individual preference. The internal saphenous vein as it crosses the anterior aspect of the internal malleolus has much to recommend it for emergency transfusion. It can be exposed in a few seconds in the fattest of patients or in the newborn babe. There is no need to search for it by palpation or to apply a tourniquet to display it. It is always present, and practically constant in position. Even at birth it is of a reasonable size. With only the ankle exposed it is easy to keep the patient warm; and, moreover, to her the psychological value of operating on a site removed from her field of view is considerable. A further advantage is that no splinting is required even if the transfusion is maintained for many hours. If the cannula and tubing are connected as sketched in Fig. 2 freedom of movement within reasonable limits is given to the limb.

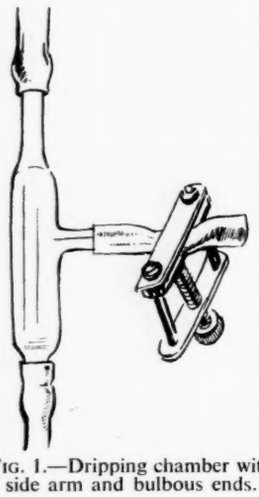

FIG. 1.—Dripping chamber with side arm and bulbous ends.

It may be asked why it should be necessary to use the drip apparatus in transfusing emergency cases when immediate replacement of blood loss is the first essential in treatment. One advantage has already been mentioned

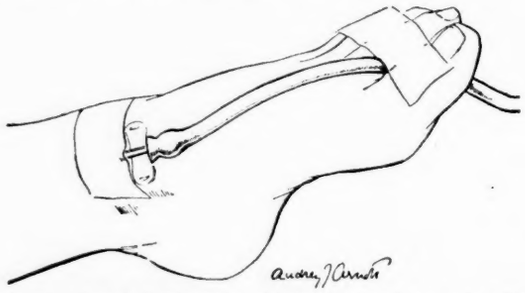

FIG. 2.—Sketch illustrating tubing supported by toes. No splinting necessary.

—that without assistance it permits of a glucose or gum saline being given while compatible blood is being obtained. It is also easily controlled and provides a means of avoiding repeated transfusion. The patient who is exsanguinated may have her life saved by a pint or less of blood, but will be left with a severe secondary anaemia requiring many weeks of adequate iron therapy before the blood picture is restored to normal limits. If, however, once the stage of immediate anxiety is over, the transfusion is maintained at a slower rate, the response of the patient is dramatic, and weeks or even months of ill-health may be avoided. This is well illustrated by the following case:

> The patient, aged 24, a 2-para, was admitted in a collapsed and exsanguinated condition following haemorrhage during the abortion of a six-weeks foetus. She was scarcely able to speak, and could not remember her name or how many children she had. She was still bleeding on admission, but the haemorrhage ceased as she arrived in the ward. Her haemoglobin was 30 per cent. A drip saline was begun while a donor was obtained. Twenty-two ounces of blood were then given, followed by a pint of glucose saline; this was followed by a further twenty ounces of blood and a second pint of glucose saline. The administration of these lasted twenty-four hours. The uterus was then evacuated. Iron therapy was started, and six days after operation the patient had a haemoglobin of 55 per cent. She then felt so well that she was anxious to go home.

With the best of equipment and the best of intentions, a scheme for emergency transfusion must always break down unless the doctor in charge has confidence in his own ability to type and cross-type blood. In spite of the simplicity of the procedure it is amazing how many medical men find difficulty in quickly and satisfactorily performing it. The technique is so clearly described in numerous textbooks that no purpose would be served by repeating it here. It may be opportune to suggest, however, that the typing and cross-typing of blood should be a routine practical exercise for every medical student.

The problem of obtaining a compatible donor can usually be solved without difficulty. Most patients when admitted as emergency cases are accompanied to hospital by one or more friends or relations. To type them requires but a few minutes, and if none is compatible

further relatives or friends are usually available without much delay. It is a great deal more satisfactory from every point of view to secure a donor from the family circle than from a transfusion service. Unfortunately, however, it is not always possible to do this, and an emergency list of donors should therefore be at hand. As a final resort, in case of extreme emergency the doctor himself may be a suitable donor; but how many medical men are aware of their own blood group?

Conclusion

It is perhaps advisable again to make it clear that blood transfusion is not being advocated as necessarily the method of choice in the treatment of pregnancy and gynaecological anaemia. It is advocated, however, for the severe haemorrhages which occur from time to time in every clinic and many private practices. Severe antepartum and post-partum haemorrhage, the extreme collapse due to extensive internal bleeding in certain ectopic gestations, the exsanguination that is at times associated with abortion or hydatidiform mole, and the collapse in severe haemorrhage of the newborn are all examples of those accidents which at the present time account for over 300 lives each year in England and Wales alone. It is for this type of haemorrhage that the wide adoption of emergency transfusion is urged as the most effective method of saving life.

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THE NATURE OF GROWING PAINS AND THEIR RELATION TO RHEUMATISM IN CHILDREN AND ADOLESCENTS

BY

J. C. HAWKSLEY, Ph.D., M.D., M.R.C.P.

Assistant Physician to University College Hospital

While the phrase "growing pains" is apt to provoke the comment that there is no evidence that the process of growth is painful, it is still widely used as a diagnosis for cases of pain in the limbs of growing children and adolescents. Its use and abuse have often provoked controversy because of vagueness, particularly as regards the aetiology of the pains. A definition of what is meant clinically by growing pains must vary with the observer's own individual taste, but in most cases it would probably be found to indicate pain, sometimes recurrent, felt in the limbs or back by a growing person in whom there was no evidence of acute or subacute rheumatism, trauma, or local infection. The condition thus defined is common throughout school age, and may be seen for several further years beyond this: growth may be directly responsible for skeletal pain in a number of cases by causing an increased strain through weight-bearing on some postural deformity such as flat-foot, knock-knee, or scoliosis.

For many years it has been felt that growing pains were perhaps to be regarded as direct manifestations of rheumatism, and therefore of a disease capable of provoking carditis; but again there has been no uniformity of medical opinion. There are those who consider the two conditions to be quite unrelated, and also those who regard cases thus diagnosed as potential cases of rheumatic carditis, to be treated with periods of rest, absence from school, and curtailment of physical exercise. This state of affairs is very unsatisfactory, since it is clear that if there is in fact a danger of carditis insufficient care is often being exercised, while if there is not, a large number of young people are having their activities curtailed and scholastic careers impaired by prolonged periods of treatment by rest, and are being educated as partial invalids to no purpose.

A series of approximately 1,000 children and adolescents has been investigated in London and Birmingham over the last ten years (Hawksley, 1938), the object being to ascertain whether or not rheumatism and growing pains are related. The conclusions reached were that growing pains are not symptoms of rheumatism and are not associated with or followed by carditis; that growing pains are associated with a number of clinical abnormalities which can be adequately diagnosed on clinical grounds; and that treatment directed towards the underlying cause is usually successful in stopping the pain. The supposed association between growing pains and carditis is largely dependent on the layman's tendency to talk loosely of limb pains in children as growing pains from ignorance of the symptoms of true rheumatism, and also on the tendency of physicians to accept a history of skeletal pain in a child as possible evidence of rheumatism without adequately ascertaining the site and type of the pain and its association with other features in the patient's history and clinical investigation.

Sheldon (1936) collected a series of 189 cases of growing pains at the Hospital for Sick Children, Great Ormond Street. After a lapse of four years he found that only two had developed rheumatism with carditis, and none chorea. He stresses the absence of relationship between growing pains and sore throats, and also mentions the fact that there is no evidence of the histological change of acute rheumatism to be found in patients with growing pains. A number of debilitating diseases are associated with pain of the typical growing-pain type. Bray (1931) quotes a series occurring in cases of asthma in childhood.

Frequency of Occurrence of Growing Pains

During the year 1928 a series of 505 children between the ages of 4 and 14 was examined at University College Hospital and an inquiry was made into the number who had growing pains: it was found that 33.6 per cent. had suffered from them. A series of 206 children seen in 1930–1 at the Children's Hospital, Birmingham, revealed a somewhat higher percentage. Accepting the lower figure as more appropriate for London children, one child in three is at one time or another afflicted with growing pains, and therefore in all probability one child in three that develops rheumatism will also have had growing pains. Many mothers will have regarded the pain complained of as something that the child has had before and will have failed to appreciate that a new type of pain has arisen. An inquiry by the doctor at this stage would reveal differences, and a clinical examination would show that the pain was now definitely articular, that the child was ill and possibly anaemic, that there was fever and also tachycardia. The further investigation of the case in hospital would probably demonstrate changes in the blood and the electrocardiogram, indicative of active disease, that are not seen in association with growing pains. It must also be remembered that primary cardiac rheumatism is a clinical entity: Findlay (1931) found that, of 489 children in Glasgow with cardiac disease other than of congenital origin or septic nature, 8.6 per cent. had nothing in their previous history to account for it. For every three cases of primary cardiac rheumatism one will probably have had growing pains. Another feature to which the frequency of occurrence of growing pains

draws attention is that many children are suffering from pain of considerable severity which is all too often being inadequately treated. No observations have been made on the social distribution of growing pains, but the investigation of 505 children in 1928 revealed that damp housing accommodation was just twice as common in the growing-pain group as in the control group, a fact that is in agreement with Sheldon's findings concerning the effect of damp weather on the incidence of growing pains.

The Nature of Growing Pains

A series of 115 cases of growing pains was collected at the Hospital for Sick Children in 1934 for more detailed study of the clinical features presented. The cases were referred from the out-patient clinics by different physicians and clinical assistants, so that any personal factors in diagnosis were as far as possible ruled out. A number were being watched in the rheumatic clinic, and were referred from this. The following were the chief clinical findings:

The pain was predominantly muscular: it was so in ninety-eight of the 115 cases (85 per cent.); and in those who complained of joint pain this, on closer examination, was usually found to be near, rather than in, the joint. The actual sites of the pain were most commonly the front of the thighs, the calves, and behind the knees; less commonly in the backs, shoulders, arms, and instep; the groin is also sometimes affected. There was no tenderness of joints, no pain on movement, no swelling, and no redness; it was rare to find tenderness of affected muscles, except in one or two cases which were diagnosed as fibrositis. The nature of the pain is usually quite different from that of rheumatism, being of a very nagging and severe type: inquiry of children who have had both conditions reveals that the pain is subjectively quite different.

It is rare to see a child with rheumatism in tears with the joint pain, and a number of experienced ward sisters who have been questioned state that they have seldom known it to happen. In contradistinction to this no less than 45 per cent. of the 115 patients with growing pains had at one time or another been reduced to crying with the pain; many were 11 or 12 years old at the time, and it takes a lot of pain to reduce London children of that age to weeping. A feature noted by many parents was the tendency of growing pains to make their children sulky and irritable. There was a preponderance of girls in the 115 cases in the ratio of 70 to 45.

A classification of the cases into various types for the purpose of observing whether coexisting abnormalities were in any way connected with the limb pain had the following result: a frequent cause of the pain is a postural or orthopaedic defect such as flat-foot, knock-knee, scoliosis, or bad stance; treatment of the cause in these cases nearly always gives relief. During the last eighteen months a number of such cases, many of which had for a time been ineffectually treated for growing pains, have been referred to Drs. N. Kellgren and A. S. Wesson of University College Hospital for physical treatment for correction of postural defects; these patients included some who were seen in 1935 and had since then reached adolescence without losing the pains. The success of the treatment has been most satisfying, and the majority have rapidly ceased to complain of pain.

Vague ill-health is a common finding, and thirty-nine of the cases had frequent respiratory catarrh, the pains usually coinciding. Many adults complain of dull aches in the limbs when they have a cold. Successful treatment of the catarrh certainly diminishes the frequency and severity of the pain.

Fibrositis is a rather uncommon cause, and the only one in which tenderness can be demonstrated. Psychological maladjustment was unexpectedly frequent, resulting in unhappy school or home life; whether this has any relation to the frequency of pain is debatable, but Neustatter's work (1937) suggests that it may have. Tiredness, specially associated with postural defect, was common, as was also inadequate sleep, a feature noted by Seham and Hilbert (1933). Adequate rest and a holiday were usually effective in banishing the pain in these cases. Only a few cases failed to fall into one of the above groups, and it is possible that more adequate investigation would have diminished these. The common associations of the pain were postural and orthopaedic defects, vague ill-health, emotional strain, and physical and mental tiredness; not infrequently more than one factor was present. Treatment of the cause was usually successful in banishing the pain, and failure suggests inadequate diagnosis.

In contradistinction to active rheumatism—where anaemia is common and in acute cases a leucocytosis may occur—twenty-five complete blood counts failed to reveal any characteristic abnormality. The sedimentation rate was estimated in nearly all cases, and over several months in a large number. The labile nature of this test renders it unsatisfactory as a routine means of differentiation between growing pains and rheumatism. Thirty-nine cases had a raised sedimentation rate on at least one occasion, and though it would probably be safe to assume that a normal sedimentation rate indicates that active rheumatism is not present, the converse cannot by itself be held to be true—a fact that became obvious from further examination of the cases mentioned.

There is a curious tendency towards vasomotor instability in many cases: the result of pricking a finger to obtain blood resulted in vasovagal syncope severe enough to put the child on the floor in over 10 per cent. of the 115 cases seen. I have pricked hundreds of children, and never seen one faint on any other occasion. Keith (1938) found a lengthened P–R interval to be a common early change in the electrocardiograms of early cardiac rheumatism. Sir Thomas Lewis kindly investigated twenty cases with active growing pains, and found no evidence of this phenomenon.

It has been previously pointed out (Hawksley, 1931) that, whereas Hill and Allan (1929), using the colour of eyes and hair as a means of classification, found no evidence for believing in the existence of a rheumatic type of child, growing pains occur more frequently in dark brown-eyed children than in Nordics; Jewish children seem to be very prone to growing pains.

Relation of Growing Pains to Rheumatic Carditis

After a lapse of four years sixty-four unselected cases from the 115 seen in 1934 were re-examined; *none* showed any evidence of cardiac involvement. Adding these cases to Sheldon's, it will be seen that of 253 children followed up for four years at the Hospital for Sick Children only two have developed evidence of rheumatic heart disease, or less than 0.8 per cent. The incidence of cardiac rheumatism in 301,392 L.C.C. school children examined in 1936 was 0.8 per cent.*

Conclusions

Growing pains and rheumatism resemble each other only to the extent that both produce pain in the limbs. Careful case-taking and examination will enable a differential diagnosis to be made in nearly every case. The impor-

* L.C.C. School Medical Officer's Report, 1937, p. 41.

tance of making a correct differential diagnosis cannot be overestimated ; for while it is bad to fail to treat rheumatic cases with potential carditis by rest, it is equally bad to treat children with growing pains by making invalids of them, by depriving them of their freedom, and by curtailing their instruction at school. Most cases of so-called growing pains can be treated effectively in accordance with the cause of the pain as found on clinical examination. The following clinical features serve to distinguish the two conditions.

1. The site, nature, and intensity of pain are different. Rheumatism affects joints and is usually accompanied by tenderness on pressure and movement. There may be redness, swelling, or effusion. In growing pains, muscles, ligaments, and tendons are usually the site of the pain ; tenderness is rare, and there is no swelling, effusion, or redness. The pain is subjectively different in the two diseases, and is more nagging and more likely to cause crying in the non-rheumatic case.

2. In growing pains a cause of the pain is often found in postural or orthopaedic defect. Tiredness and vague ill-health are common to both diseases, but patients with growing pains are usually sulky and unsociable ; this, in the author's experience, is uncommon in rheumatism.

3. Nodules do not occur except in rheumatism.

4. There is no significant change in the temperature in cases of growing pains (Seham and Hilbert, 1933). There is also no tachycardia.

5. Cases of growing pains as a rule show no anaemia ; rheumatic cases frequently do.

6. Cases of growing pains have no antecedent sore throat (Sheldon, 1936).

7. Cases of growing pains show no lengthening of the P–R interval on electrocardiography.

8. Evidence is brought forward to show that the incidence of carditis subsequent to growing pains is not greater than would be expected to occur in the child population generally.

Summary

The meaning of the term " growing pains " is discussed.

The incidence of the pains in children and adolescents is surveyed.

The nature of growing pains and the possibility of their relationship to rheumatism are discussed.

The clinical features that distinguish these two conditions are recorded.

I am very grateful to the physicians of the Hospital for Sick Children for permission to examine and follow up their cases, also to Dr. Nabarro for permission to carry out the pathological tests done in 1934 in his laboratories. I am also indebted to the physicians of the Birmingham Children's Hospital for allowing me access to their cases. I have received much help from the lady almoner's department at the Hospital for Sick Children, particularly Miss Salmon, Miss Adams, and Miss Lewis. Dr. Sheldon very kindly gave me access to unpublished results, which I have quoted more fully in another paper (Hawksley, 1938). The investigations at the Hospital for Sick Children in 1934 were carried out whilst under tenure of the Sebag-Montefiore Research Fellowship, and the medical unit of University College Hospital has defrayed the expenses of the follow-up of sixty-four cases.

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CONGENITAL OCCLUSION OF THE POSTERIOR NASAL CHOANAE

BY

DEREK BROWN KELLY, M.B., F.R.F.P.S.

Assistant Surgeon, Throat, Nose, and Ear Department, Victoria Infirmary, Glasgow

Congenital occlusion or atresia of the posterior nasal choanae was at one time considered to be a relatively rare anomaly. From a search of the literature Fraser (1910) could gather records of only 115 cases. During the past few years, however, more cases have been reported, due no doubt to the fact that not only rhinologists but also obstetricians and practitioners are on the look out for the condition. This form of nasal obstruction really deserves even wider recognition, for the symptoms in a baby are sometimes alarming, and their cause can be a source of puzzlement to the physician. A newborn infant with bilateral choanal atresia suffers from considerable difficulty in breathing. Its instinctive attempts to breathe through the nose result in severe dyspnoea and even cyanosis, which is relieved only when the mouth is opened to cry. A cycle of attacks of dyspnoea alternating with fits of crying and relief of symptoms is thus established, and forms a typical clinical picture. Sucking, and consequently nutrition, are also interfered with.

Unilateral cases are rarely recognized early in life. It is only when the patient is old enough to realize that one nasal passage is blocked, and there is a troublesome discharge of mucus, that relief is sought. Mistakes in diagnosis are not infrequent, the obstruction and discharge being ascribed to sinusitis or adenoids. Operations for the relief of these conditions have been performed without the real state of affairs being recognized.

The obstruction is caused by a failure of absorption of the bucco-nasal membrane. It may be unilateral or bilateral ; in structure membranous, bony, or partly membranous and partly bony. Onodi has recorded the only known instance in which cartilage entered into the construction. Females are affected more often than males.

The Cause of Choanal Atresia

Before the embryology of the nose was fully understood, several theories as to the cause of choanal atresia were put forward. It may be of interest to mention briefly the chief of these. Luschka (1860) maintained that the obstruction was due to an upward and backward growth of the horizontal plate of the palatine bone. Kundrat, on the other hand, considered that it was the vertical plates of the palatine bone which extended inwards to meet the inner wall of the choanal orifice (vomer). An original view, taken by Bitot, was that the occlusion consisted of a separate independent bone. The occasional presence of sutures in the bone was put forward in support of his theory.

It is now generally accepted, however, that the obstruction is due to the persistence of a vestigial epithelial structure—the bucco-nasal membrane. This is a partition between the mouth and the nose, closing the posterior end of each olfactory pit in the embryo. It is formed by the apposition of nasal and stomodaeal epithelium, and ruptures about the fifth week, thus establishing the primitive choanae, or openings between the olfactory pits and the stomodaeum. In cases of posterior choanal occlusion this membrane fails to absorb, and the extent of

mesenchyme resorption between the two epithelial layers determines whether the obstruction is membranous or osseous. The completeness or otherwise of the atresia is largely governed by the degree of dorsal expansion or growth of the nasal fossae, and also by the amount of absorption which takes place in the floor of the secondary nasal fossa dorsal to the primitive choanae (Schaeffer, 1934).

Case History

B. M., aged 20, a lady clerk, was seen on April 12, 1935, complaining of complete left-sided nasal obstruction, which had been present since birth. A discharge of mucus from the affected nostril was troublesome, resulting in excoriation of the skin of the upper lip. She was quite unable to blow the passage clear.

On examination the left nostril appeared narrow and undeveloped. There was definite asymmetry of the face, the left side being rather expressionless and not so full as the right. No difference in development of the two sides of the chest (as is sometimes present in these cases) could be made out. Anterior rhinoscopy showed the right side of the nose to be normal, the septum being fairly central. On the left side the mucosa appeared pale and sodden, and much thick glairy mucus had to be removed with a suction pump before a view could be obtained. The inferior turbinate was then seen to be smaller than that on the right side. After the application of cocaine and adrenaline, an obstructing wall was apparent far back which prevented the passage of a probe into the nasopharynx. The septum and nasal floor did not meet this wall at an angle, but gradually merged into it. Palpation with the probe proved it to be bony in nature. Inspection of the mouth revealed asymmetry of the hard palate, which was definitely higher and more arched on the left side. Posterior rhinoscopy showed the left choana to be completely occluded by a partition or diaphragm, covered with apparently normal mucosa, and having a dimple or recess near its centre.

On April 19 the left side of the nose was filled with lipiodol and *x*-ray photographs were taken in the hanging-head position. Inspection of the radiographs revealed some interesting points. Normally the lower border of each choana is formed by the posterior edge of the horizontal part of the palatine bone which abuts on the maxilla. This edge lies just behind the plane of the third molar tooth in the fully developed adult skull. On reference to the photographs, it was seen that the lower border of the bony occlusion was considerably anterior to this—namely, opposite the first molar. In this region lies the palato-maxillary suture. The reason for this forward position of the occlusion is explained by the fact that the primitive choanae do not correspond in position to the permanent posterior nares. The latter are placed much further back, and are established only in the third month when the permanent palate has been developed. From below, the partition passed upwards and backwards in a sloping direction until it reached the choanal roof, where the medial pterygoid lamina of the sphenoid articulates with the palatine bone. The plate taken in the occipito-mental position showed considerable asymmetry of the nasopharynx, which was encroached upon by the bony partition on the left side, extending backwards as well as laterally from the posterior edge of the septum.

Operation.—The left side of the nose was packed with gauze moistened with 10 per cent. cocaine and adrenaline. Half an hour later a general anaesthetic was administered and continued through an intratracheal catheter. By means of a long fine chisel passed through the left nostril an opening was made in the bony partition. This was quite thin near its centre, but in its lower and lateral aspects became very much thicker, causing some difficulty in making a satisfactory aperture. The edges were trimmed with a sphenoidal punch, and finally a portion of the posterior edge of the septum was removed with adenoid forceps. A rubber drainage tube was then passed via the nostril through the ostium into the nasopharynx, but this was not tolerated by the patient for more than twenty-four hours. There was slight subsequent narrowing of the opening, as occurs with all artificial ostia in the nose, but up to date (September, 1938, three years after the operation) the patient is still able to breath freely through the affected nostril.

Notes on Operative Technique

Various operations for the relief of choanal occlusion have been described in the textbooks, but sufficient emphasis is never laid on the great thickness of bone with which the surgeon may have to contend. Although the centre of the obstructing plate is often thin and easily pierced with a trocar, the lateral aspects are usually thick enough to demand a chisel and mallet for their removal. An electrically driven burr or saw is of value in dealing with very thick bone, but the operator must be skilled in the use of such instruments.

The operation leaves a circular wound with rough, irregular edges. This results in a ring of granulation tissue which gradually contracts. The consequent early closure of the artificial opening is therefore a problem in the after-treatment. A drainage tube inserted through the ostium and projecting into the nasopharynx is, as already stated, badly tolerated. An attempt to overcome the difficulty is described by Brady (1918). Ribbon gauze is passed down one nostril into the nasopharynx. The end is seized by dressing forceps passed through the other nostril, drawn forwards, and a knot tied in front of the columella. A fresh strip may be drawn into position by sewing it to that already in place. The process is, however, rather uncomfortable for the patient.

An attempt to cover the raw area with flaps of mucous membrane is made by Marschik (1938). He elevates and preserves the mucosa over the anterior aspect of the bony occlusion, and holds the flaps thus formed in position by means of packing. Donnelly (1938) describes a case in which he maintained patency by means of a full-thickness skin graft. This was trimmed to fit round a No. 18 French catheter, which was then passed into the nose so that the raw surface of the graft lay in contact with the denuded area in the choana. The graft took well and the nose remained patent. Cemach (1938) inserted a small metal tube (4 mm. long and 8 mm. diameter) in the artificial choana. This became covered with tissue and preserved an excellent airway. In one of his cases it had to be removed at a later date on account of headache. An unusual method of operating on these cases of occlusion is described by Precechtel (1938). He employs a transpalatal route of approach to the choanae.

In the case here reported no graft or special means of plugging was employed. The ostium still remains patent for respiration three years after operation.

Summary

A case of congenital occlusion of the left posterior naris is described. The symptoms and aetiology are briefly discussed.

Attention is drawn to the difficulty of keeping patent the artificial ostium made in the occluding bony plate, and operative measures devised to overcome this problem are reviewed.

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ERYTHEMA NODOSUM ASSOCIATED WITH ACUTE TUBERCULOUS CERVICAL LYMPHADENITIS

BY

BRIAN C. THOMPSON, M.A., M.D.

Late Dorothy Temple Cross Research Fellow in Tuberculosis

(From the Health Department of Durham County Council)

In 1936 I published a paper drawing attention to the syndrome of erythema nodosum and tuberculous cervical lymphadenitis, of which three cases were described (Thompson, 1936). As these patients have now been studied for a further two years, and as three additional cases have come under observation during this interval, it is proposed now to detail the salient facts of all six.

Case Histories

Case 1.—A boy aged 8 was first seen on December 5, 1934, complaining of a rash attributed to a kick on the ankle received two weeks previously, together with malaise and progressive swelling of the neck. The skin lesions distributed over the anterior surface of both legs below the knee were typical of erythema nodosum. There was an adherent mass of lymph nodes at the angle of the jaw on the right. The throat was hyperaemic, and in the upper pole of the right tonsil was a shallow oval ulcer, 5 by 3 mm., with an irregular whitish floor. This was at first thought to be a simple follicular tonsillitis, but it persisted under treatment with gargles for three months. The erythematous nodes faded and were gone within three weeks; the lymphadenitis did not improve, but assumed the chronicity typical of tuberculosis. Weekly injections of Béraneck's tuberculin were given subcutaneously until a tolerance limit of 0.8 mg. was reached, when 0.005 mg. tuberculin P.P.D. was substituted. On May 12, 1936, fluctuation was detected and incision with drainage performed, and a month later local *x*-ray applications were started. The residual mass persisted and the sinus continued to discharge intermittently up to the time when the patient was last seen (April 5, 1938).

Case 2.—A domestic servant aged 23 developed a swelling above the right clavicle which rapidly attained the size of a hen's egg. A few days later a rash appeared on her legs, after which the cervical mass diminished in size. For several years she had been subject to sore eyes, but her health had been otherwise good, apart from an attack of pneumonia in childhood. Seen first on October 14, 1935, she was found to be a well-nourished young woman, with fading erythema nodosum over both tibiae and severe phlyctenular keratitis in the left eye. There was a group of lymph nodes above the right clavicle, the largest of which was the size of a walnut, firm and fairly mobile, and some smaller nodes in the right axilla. *X*-ray examination showed several large calcareous shadows in the right lung hilum, but no evidence of any parenchymatous lesion. The patient was admitted to Seaham Hall Sanatorium and immediately became worse: severe phlyctenular disease affected both eyes, with muco-purulent discharge and gross photophobia, while additional enlarged lymph nodes appeared in the upper part of the right posterior cervical triangle, and the mediastinal shadow in the region of the calcified deposits noted in previous radiographs became enlarged to the right. Tuberculin B.E. was given subcutaneously up to a dosage of 0.00001 mg., and after ten months the patient was discharged from the sanatorium with the supraclavicular lymph nodes quite small and discrete, the mediastinal shadow within normal limits, and her eyes apparently normal. On November 2, 1936, she had another attack of erythema nodosum, with a mild exacerbation of conjunctivitis but no other clinical abnormality. These symptoms cleared up rapidly and the patient remained well, except for some small lymph nodes which at her last attendance on June 20, 1938, were still palpable above the right clavicle.

Case 3.—A boy first came under observation in 1932 at the age of 9, with enlarged lymph nodes above the left clavicle. An abscess was incised on April 24, 1933, the resulting sinus from which healed within a month, and subsequently further lymph nodes became involved throughout most of the left and right posterior cervical triangles and also in the right axilla. None of these reached a size greater than that of a cherry, and the patient's general condition remained excellent. He attended the dispensary at regular intervals up to May 13, 1935, when he stated that some spots had broken out on his legs a few days previously. These proved to be typical lesions of erythema nodosum. There were no constitutional symptoms except slight pain in the right supraclavicular lymph nodes, which appeared slightly larger than had been noted at his last visit six weeks previously. *X*-ray examination showed an old calcified focus in the left mid-lung field and several calcified deposits in the corresponding hilum, but no active lesion. He was given tuberculin injections weekly for three months, during which time all the superficial lymph nodes became quite small. They remained so for the next eighteen months, when those on the right again became enlarged, spreading up to reach the angle of the jaw, and on April 5, 1937, a second attack of erythema nodosum occurred. Two weeks later an abscess formed above the right clavicle and broke down to form a sinus which continued to discharge for two months. Tuberculin was given subcutaneously for a further four months, at the end of which time all the lymph nodes were apparently quiescent. When last seen on November 2, 1937, the patient was fit and well, and shortly afterwards left the district to take up a job.

Case 4.—A boy aged 10 became acutely ill with fever, sore throat, swelling of the left side of the neck, pain and photophobia in the left eye, and a rash on the anterior surface of both legs. Seen at his home two weeks later, he was a well-nourished boy, not very ill, but distressed by a left phlyctenular kerato-conjunctivitis and the tender lesions of severe erythema nodosum. There was acute tonsillitis with bilateral follicular exudate, and the lymph nodes at both angles of the jaw, more on the left than on the right, were massively enlarged, firm, and adherent. Gargles were ordered and the tonsillitis soon cleared up, the skin eruption fading also. The lymph nodes on both sides subsided, those on the right becoming almost impalpable, while those on the left remained as large as a cherry. Two phlyctenules persisted in the left eye, and the right eye also became affected. On June 16, 1936, weekly injections were begun with tuberculin P.P.D., and after reaching a tolerance of 0.001 mg. in one month Béraneck's tuberculin was substituted. This treatment was continued up to a dosage of 1 mg. on April 27, 1937, when the eyes were much improved and the lymph nodes quite small, firm, and mobile. The patient remained well for nine months, when the lymph nodes on the left again became enlarged. On January 25, 1938, caseous material was aspirated from the cervical mass, and six weeks later incision and drainage was performed. When last seen on July 26 a sinus at the left angle of the jaw was still discharging. The patient was otherwise well, and both eyes appeared normal.

Case 5.—A girl aged 9 was taken ill with sore throat and acute swelling of the neck, followed three days later by a rash on the legs and high fever. The cervical mass was noticed to become smaller, and when she first attended the dispensary eight weeks later, on July 13, 1936, it presented itself as a group of lymph nodes up to the size of a walnut at the right angle of the jaw, firm in consistency and mutually adherent. Unmistakable lesions of erythema nodosum were still present, besides residual staining from earlier crops, and the intradermal Mantoux test was positive to 0.0002 mg. tuberculin P.P.D. The patient was by this time no longer ill, and continued an uneventful convalescence. Four months later she had gained 2 lb. in weight and her cervical lymph nodes were small, firm, and discrete. In the spring of 1937, however, she had recurrent attacks of tonsillitis and lymphadenitis. In April her tonsils were removed, and a month later a large

mass of caseous lymph nodes was excised from below the right angle of the jaw. Her general condition deteriorated, and on July 28, 1937, in addition to a large residual mass of lymph nodes adjacent to the recent operation, rales were heard in the lungs, and she was admitted to Stannington Sanatorium, where *x*-ray examination showed tuberculous infiltration of the left lung and enlarged tracheo-bronchial lymph nodes. She was put to bed, and her temperature and blood-sedimentation rate slowly subsided. By the end of the year the hilar shadow had retracted and the lung parenchyma became clear. She was discharged the following June, and when last seen on July 26, 1938, appeared very well. No peripheral lymph nodes were palpably enlarged.

Case 6.—A domestic servant aged 20 attended the dispensary during the years 1924 to 1930, having tuberculous lymphadenitis of the left tonsillar group with sinus formation. In 1934 this recurred; but it soon healed up, and she remained in good health up to April, 1936, when a swelling appeared beneath the right jaw. A week later spots broke out on her legs, and the cervical swelling became rather smaller. When first seen on April 20, 1936, a week from the onset of the eruption, which was found to be erythema nodosum, the right submaxillary lymph nodes were the size of a walnut, and shortly afterwards the submental and tonsillar lymph nodes also became enlarged. The skin lesions faded within three weeks, and the patient was admitted to Seaham Hall Sanatorium. Radiographs showed no intrathoracic tuberculosis. She was discharged after two months' routine treatment, with her lymphadenitis apparently subsided, and on October 7, 1936, only a few small nodes were palpable in the right tonsillar and submaxillary groups. Shortly after this she left the district to take a domestic situation in London, and when last heard of, in November, 1937, was reported to be in excellent health.

Clinical Features

It is convenient to consider these first under separate heads.

The Eruption.—This did not differ materially in intensity or extent among individual patients, nor from erythema nodosum as commonly seen in this district (Thompson, 1938). The lesions appeared in crops, were raised, red, and tender, and were limited in all cases to the anterior surface of both legs below the knee. There were recurrent attacks in Case 2 thirteen months later and in Case 3 two years later. The second attack in the former case was not attended by any clinical change in the peripheral lymph nodes, while in the latter case the supraclavicular lymph nodes, which had been enlarged for several years, softened and ulcerated through the skin within a fortnight. So far as could be judged, the eruption in the second attacks was neither milder nor more severe than in the initial attacks.

The Lymphadenitis.—In Cases 1, 4, and 5 the upper deep cervical (tonsillar) group of lymph nodes was involved, in Cases 2 and 3 the supraclavicular group, and in Case 6 the submaxillary followed by the tonsillar and submental groups on the same side. The skin eruption and lymph-node enlargement appeared more or less simultaneously in Cases 1, 3, and 4. In Cases 2, 5, and 6 the latter clinically preceded the former, and it is remarkable that with the appearance of erythema nodosum the lymph nodes in these cases at once became much reduced in size. Gross softening of the lymphadenitis occurred in Cases 1, 3, 4, and 5, with liquefaction and breaking down after intervals of seventeen, twenty-three, twenty, and ten months respectively. In the other two cases the chronicity and physical characteristic of the masses, together with collateral evidence, justified the diagnosis of tuberculosis.

Phlyctenular Kerato-conjunctivitis.—This was present in Cases 2 and 4, appearing for the first time in the latter case coincidently with the eruption. The patient in Case 2 had complained of sore eyes intermittently for several years, and the onset of erythema nodosum was accompanied by an exacerbation which was typically phlyctenular. A further exacerbation occurred when this patient underwent a second attack of erythema nodosum. Both eyes were ultimately affected in both cases.

Sore Throat.—This was noted in Cases 1, 4, and 5. In Case 5 there was generalized faucial hyperaemia, in Case 4 bilateral tonsillitis with follicular exudate, and in Case 1 an area of ulceration which persisted for three months on the tonsil of the same side as the lymphadenitis. The sore throat was noticed at the same time as, rather than previous to, the other symptoms of rash and cervical swelling.

Previous Tuberculosis.—Cases 2 and 6 were known to the dispensary for several years before the present illness as examples of tuberculous lymphadenitis. In Case 3, and also in Case 2, *x*-ray examination showed calcareous intrathoracic shadows indicative of long-standing healed or partially healed tuberculosis. There was nothing in the history or physical findings in Cases 1, 4, and 5 to indicate any previous tuberculosis. Contact with a known source of tuberculosis was not discovered in any case, though the father of the patient in Case 1 had a history of old cervical lymphadenitis. Progressive pulmonary tuberculosis has not yet occurred in any of the six patients.

The above findings may for comparison be tabulated thus:

Case No.	Sex and Age	Lymph-node Group	Sore Throat	Abscess Formation	Cervical Swelling preceded Skin Eruption	Phlyctenular Disease	Evidence of Previous Tuberculosis
1	M., 8	Tonsillar	+	+	−	−	None
2	F., 23	Supra-clavicular	−	−	+	+	Calcified tracheo-bronchial lymph nodes
3	M., 12	Supra-clavicular	−	+	−	−	Calcified pulmonary focus; chronic tuberculous cervical lymphadenitis
4	M., 10	Tonsillar	+	+	−	+	None
5	F., 9	Tonsillar	+	+	+	−	
6	F., 20	Submaxil-lary	−	−	+	−	Old tuberculous cervical lymphadenitis

From the table it is evident that certain features occurred in Cases 1, 4, and 5 which were absent from Cases 2, 3, and 6—namely, that sore throat was present, that the group of lymph nodes involved was the upper deep cervical (tonsillar), and that there was no evidence of previous tuberculosis. This last negative feature is largely presumptive. It is not known whether previous to the illness these patients would have reacted negatively to tuberculin. On the other hand, Group B—Cases 2, 3, and 6—in which the evidence of previous tuberculosis is incontrovertible, the age of onset of the present illness was constantly higher than in Group A—23, 12, and 20 compared with 8, 10, and 9 years respectively. Thus the patients in Group A were at an age prone to first infection with tuberculosis, which those in Group B might be expected to have passed—as indeed it is known they had—according to the figures available in this country for tuberculin-positive reactors distributed by age (Hart, 1932).

The lymph nodes involved in Group A belonged to a group anatomically in close relation to the tonsil (Wood, 1905), through which it seems likely that tubercle bacilli gained entrance. It has been repeatedly shown that tuberculosis of this group of lymph nodes is associated in a

high proportion of cases, if not in all, with microscopic primary foci in the corresponding tonsil, which, conversely, are rarely found in patients without clinically tuberculous lymphadenitis (Webster, 1932; MacCready and Crowe, 1924; Mitchell, 1917). It is therefore probable that in each of these three cases the portal of entry and primary focus of tuberculosis was in one or both tonsils, though the age of the focus and the duration of the infection are uncertain. It may be that it was of recent date and that the appearance of clinical lymphadenitis marked the end of an incubation period, with the development of allergy revealed by the sudden onset of the cutaneous lesions. Wallgren (1938) supports this hypothesis with a number of cases of erythema nodosum accompanied by primary tuberculous infiltrations of the pulmonary parenchyma, in which the patients were known to have been tuberculin-negative previous to exposure to tuberculous infection accurately determined within three to eight weeks before the eruption.

On the other hand, it is possible that tuberculosis had been latent for a prolonged period in either tonsil or lymph nodes or both, to be roused into activity by some external factor. Here the occurrence of sore throat may be regarded as significant. That septic tonsillitis may light up dormant tuberculous foci is advanced by Forman and Whitwell (1934) as a reason for its frequently accompanying erythema nodosum. Its influence as a source of secondary infection is suggested in the present series by the fact that the lymphadenitis in the three patients of Group A, who all had tonsillitis, in each case subsequently underwent softening and abscess formation, a feature absent from all the patients of Group B except Case 3. It is recognized that whereas liquefaction of this type often occurs in uncomplicated tuberculous foci, it is aggravated and accelerated by secondary invaders.

It might be argued that, although the lymphadenitis in this group was undoubtedly tuberculous, the skin eruption was not directly related thereto but was due to whatever pyogenic organism was responsible for the tonsillitis. Spink (1937) describes erythema nodosum as "a non-specific inflammatory reaction of the skin to a variety of agents, including the tubercle bacillus and the streptococcus"; and in cases of erythema nodosum where tuberculosis was proved absent injection of streptococcal endotoxin has demonstrated skin sensitivity (Collis, 1932) and even produced fresh outcrops (Coburn and Moore, 1936) which may be histologically indistinguishable from the initial lesions (Ernberg, 1921). Most authorities, however, agree with Wallgren that an aetiology other than tuberculous can only be postulated in the proved absence of tuberculosis. In these three cases tuberculous features were no less well marked than in the three cases of Group B, in which there was no suggestion of streptococcal infection, and it is therefore reasonable to suppose that the aetiology common to all was intimately connected with tuberculosis.

According to Wallgren's theory, the cases of Group A would fall into the primary and of Group B into the post-primary type of tuberculous erythema nodosum. The latter group, known to have been previously infected, would then be supposed to have undergone an "undulation of allergic level," in which sensitivity to tuberculous toxins had become depressed either by some infection or by the dying out of focally retained tubercle bacilli, to reappear suddenly on recovery in the former circumstances or on fresh exogenous reinfection or endogenous reactivation in the latter, with the production of a nodular skin reaction.

None of the cases in Group B showed signs of intercurrent non-tuberculous infection, and the evidence suggests that an allergic upset may have been caused by reactivation of dormant tubercle bacilli in lesions apparently quiescent. In Case 2 the first sign of fresh tuberculosis occurred in the supraclavicular lymph nodes, which normally drain the upper chest wall. The calcareous tracheo-bronchial lymph nodes were shown by *x*-ray examination to undergo enlargement about this time, which may indicate either that the old intrathoracic disease had become active or that new tubercle bacilli had been inhaled from without into the lung parenchyma, to reach the supraclavicular lymph nodes by way of adhesions between visceral and parietal pleurae. This mode of reaction is typical of primary rather than of reinfection tuberculosis, and may be part of the peculiar condition of immunity and hypersensitiveness which causes erythema nodosum.

A similar theory of pathogenesis may be applied in Case 3, in which the primary pulmonary focus demonstrated by radiography may have led to the tuberculous supraclavicular lymph nodes which existed for years before the present illness. Reactivation in these nodes, though not well marked during the first attack of erythema nodosum, progressed rapidly after the second attack to ulceration and sinus formation.

In Case 6 the lymph nodes involved were submaxillary, submental, and tonsillar, in the order named. Since the previous tuberculosis was in the opposite tonsillar lymph nodes, and since tuberculosis of the tonsil is frequently bilateral (Crowe *et al.*, 1917), it is probable that the erythema nodosum in this case was provoked by reactivation of latent bacilli in either the tonsil or the tonsillar lymph nodes of the right side, with spread to and clinical disease in the homolateral submaxillary group. Though the possibility of new exogenous infection must be admitted, this is believed less plausible than the explanation offered.

No microscopical examination was made in the present series of the cutaneous lesions. This has been done by many other observers without throwing much light on their pathogenesis. Tubercle bacilli have never been constantly demonstrated in the lesions, which histologically show not definite tubercle formation but round-cell conglomerations, predominantly lymphocytic, with tissue necrosis and occasional giant cells. This picture is regarded by Forman and Whitwell as at least suggestive of tuberculosis, cut short at an early stage by the host's immune bodies, with lysis of the blood-borne bacilli. The conception of the erythematous nodes as a focal tuberculin reaction agrees with the histology of the Mantoux reaction (Ernberg, 1921) and explains the occurrence of erythema nodosum in tuberculous children following application of a routine intradermal tuberculin test (Dickey, 1932). It would be supposed that an early haematogenous dissemination of tubercle bacilli had occurred soon after primary infection, as commonly happens in the production of the generalized papulo-necrotic tuberculide, the subsequent development of allergy causing a violent inflammatory response around each embolic focus. The reason for the peculiar distribution of the lesions remains unexplained.

The phlyctenular kerato-conjunctivitis which occurred in Cases 2 and 4 may also have been an embolic phenomenon explainable on similar grounds. Phlyctenular disease is generally agreed to be of tuberculous origin (Bickerton, 1936). Meyer (Tow, 1928) has termed it "the Pirquet of the eye," and Casparis (1927), among others, claims

dramatic results from desensitization with tuberculin. It was remarkable in the present series how the phlyctenules and the erythema nodosum waxed and waned simultaneously, suggesting at least a close causal relationship. Especially was this marked in Case 2, where a second attack of erythema nodosum was accompanied by an exacerbation of the conjunctivitis.

Though the literature on erythema nodosum is considerable and many hundreds of instances have been reported of associated tuberculosis, little reference can be found to this taking the form of peripheral lymphadenitis. Foerster (1914) described a case of two sisters simultaneously affected with tuberculous cervical lymph nodes, but the eruption in one of these was probably not erythema nodosum. Symes (1928) alludes to the coexistence of lymphadenitis with the eruption, and Bull (1935) has reported a single case where erythema nodosum followed thirteen days after the appearance of a submaxillary lymph node subsequently proved tuberculous. Nowhere is it noted that, where the eruption succeeded the lymph-node enlargement, regression of the latter occurred, as was strikingly demonstrated in Cases 2, 5, and 6 of the present series. This occurrence suggests that erythema nodosum may signalize the development of resistance by the host in addition to skin-hypersensitiveness, or in other words the accompaniment of allergy by immunity. The paradox of an effect at once beneficial to the lymphadenitis and deleterious to the phlyctenular disease accords with Rich's theory of immunity and allergy as separate, even antagonistic, entities, the latter causing caseation and destruction in defensive tubercles built up by the former. The experiments upon which this conception is based (Rich, 1930), in which tuberculous animals rendered anergic by tuberculin were found to survive allergic controls, have recently been challenged by Willis and Woodruff (1937), whose findings so disagree that no indisputable experimental parallel can be cited to the clinical observations now under consideration.

Summary and Conclusions

1. Six cases are described of erythema nodosum associated with acute tuberculosis of cervical lymph nodes.

2. In three of these cases the tuberculous infection is believed to have been recent and to have gained entrance by way of the tonsil, septic follicular tonsillitis having been a contributory cause of this portal of entry and possibly also of the subsequent softening and suppuration of the tuberculous lymphadenitis.

3. In the other three cases tuberculosis was known to have been present for a number of years. The exacerbation in cervical lymph nodes concurrent with the onset of erythema nodosum is attributed to reactivation of tubercle bacilli latent in the lymph nodes in two cases and in the pulmonary parenchyma in the third case, though the possibility of exogenous superinfection must be admitted.

4. The pathogenesis of the cutaneous lesions is discussed and their identity as haematogenous tuberculous foci is suggested by the concomitant phlyctenular keratoconjunctivitis in two cases.

5. The associated lesions of skin and eye underwent exacerbation and remission more or less coincidently. On the other hand, in three cases where the initial symptom was lymph-node enlargement, this was observed to regress immediately following the appearance of erythema nodosum. The implications of these phenomena in relation to allergy and immunity are discussed.

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Clinical Memoranda

Acute Mania from Appendicitis

The development of acute mental symptoms in infective conditions is by no means uncommon; it is, for instance, often seen in pneumonia, but its occurrence in acute surgical conditions appears to be very rare. The case here recorded is therefore of some clinical interest.

Case Record

On April 26, 1938, a patient was admitted to a mental institution on a forty-eight-hour order. She was an obese woman, aged 46, who had been sent to the mental institution from a hospital to which she had been admitted four days before as a case of appendicitis. At the hospital she had been treated according to the Ochsner-Sherren (delayed) method, but the day after admission developed mental symptoms. She soon became so violent that several persons were required to restrain her, and she also attempted to throw herself out of a window. As her mental condition was getting much worse she was certified and transferred to the mental institution, having been given a large dose of morphine and 10 c.cm. of evipan before the journey.

On arrival at the mental institution she was quite maniacal and completely disorientated. The sedative drugs she had been given masked all abdominal signs, but the history of the case obtained from the relatives suggested that she had had a genuine attack of appendicitis, and in addition her tongue was furred and the breath foul. It was ascertained, too, that previously she had had no mental weakness whatsoever, but had been a completely normal woman. It appeared, therefore, that her condition might possibly be explained by infection from an acutely inflamed appendix, and hot foments were placed on the lower abdomen and an hourly pulse rate recorded. The rate gradually rose, and some seven hours later there appeared to be tenderness in the lower abdomen. She was therefore transferred back to hospital and the abdomen opened. She was found to have a gangrenous appendix and a considerable pelvic peritonitis: from the smell of the pus it was inferred that the infection was *B. coli*.

Appendicectomy was performed and the abdomen drained. For the next few days her mental condition showed no

change; she was very noisy and had to be restrained. By May 1, however, there was a distinct improvement, and by the 12th her mentality could be regarded as quite normal. She was discharged from hospital on May 27, having made a complete recovery. She was a pleasant woman, and showed no sign whatever of mental weakness. It is interesting to note that she had no recollection of the earlier part of her illness.

This case illustrates what must be a very rare manifestation of a common surgical condition. The sudden development of acute mania obscured the abdominal condition for a time, and the dramatic recovery of a normal mentality within less than three weeks of removing the infective focus was surprising.

Wolverhampton. A. H. BARBER, M.B., M.R.C.P.

Two Cases of Supracondylar Fracture of the Humerus with Absent Radial Pulse

The following two cases of supracondylar fracture of the humerus, in which the brachial artery was trapped between bone ends, may be found of interest.

CASE I

A boy aged 9 was seen on March 19, 1938, two hours after having fallen off a swing on to his outstretched left hand. Clinically there was a supracondylar fracture of the left humerus with backward displacement of the lower fragment. The brachial muscles were in spasm, and the smallest movement caused extreme pain. The radial pulse was absent. The expanded lower end of the fractured humerus could be seen to be lying just beneath the skin with little tissue intervening between it and the skin. The brachial artery was not lying in its normal anatomical position—that is, it was not in front of the lower end of the humerus. Radiographs showed a transverse fracture just above the lower epiphysis of the humerus with considerable backward displacement of the distal fragment.

The absent radial pulse was regarded as a serious matter, and immediate open operation was decided upon.

Operation.—A longitudinal incision was made over the course of the lower quarter of the brachial artery. This was found to be caught and compressed between the expanded

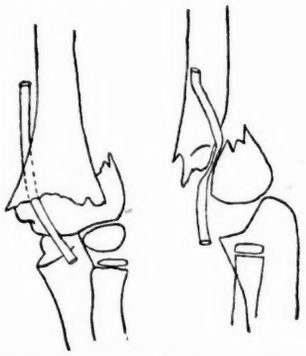

FIG. 1.—Front view of the findings at operation. The brachial artery is lying behind the lower end of the upper fragment.

FIG. 2.—Side view of the findings at operation. The brachial artery is compressed between the fragments.

lower end of the upper fragment of the humerus in front and the lower epiphysis of the humerus behind, as shown in the diagrams. The artery was freed and replaced in its normal position in front of the lower end of the humerus. The radial pulse immediately returned. The wound was then closed, the fracture reduced, and the arm put up in only partial flexion.

Present Condition.—The patient has full movements at the elbow, and normal circulation in the forearm. There is a slight increase in the carrying angle.

CASE II

A boy aged 6 was seen on June 27, 1938, three hours after having fallen from a donkey on to his outstretched left arm. The clinical findings were similar to those in Case I, except that the brachial muscles were not in spasm and the radial pulse was present on admission. The expanded lower end of the upper fragment of the left humerus could be seen under the skin, and the brachial artery was not visible or palpable in front of it. Radiographs again showed a transverse fracture just above the lower epiphysis of the left humerus with considerable backward displacement of the lower fragment.

In spite of the presence of the radial pulse, it was considered that the brachial artery must be behind the upper fragment since it was not in front of it, and that an attempt to reduce the fracture would compress it. Very carefully, therefore, an attempt was made to reduce the fracture, and it was held in the corrected position. The radial pulse was no longer present. It returned, however, when the original gross displacement was allowed to recur, there being in this case no muscle spasm to compress the artery between the bone ends.

Open operation was decided upon. The findings were similar to those at the operation on Case I, except that in this case the median nerve as well as the brachial artery was lying between the fragments. The artery and nerve were replaced in their normal positions in front of the lower end of the humerus, the fracture was reduced, and the wound closed. The arm was then immobilized in plaster.

Present Condition.—The circulation in the forearm is normal. The fracture has united in good position. There is slight limitation of flexion at the elbow-joint.

DISCUSSION

In these two cases the brachial artery was probably displaced backwards along with the lower epiphysis of the humerus and the forearm at the time of the injury, and had been unable to come forward again, as it had become trapped behind the medial portion of the expanded lower end of the humerus, which was very prominent.

Also, in each of these cases it would have been impossible to get the brachial artery out from between the bone ends without an open operation. A determined attempt to reduce the fracture without freeing the artery might easily have torn it across, thereby not only causing a permanent loss of the radial pulse, but also causing a tense deep haematoma at the elbow-joint which would interfere with the venous return from the forearm, with serious results.

As it is, both these cases have given a satisfactory result, with a normal circulation in the forearm.

I wish to thank Mr. D. S. Pracy, consulting surgeon to Nuneaton General Hospital, for permission to record these cases.

J. B. MORWOOD, F.R.C.S.I.,
Resident Surgical Officer, General Hospital, Nuneaton.

Mental Disorder associated with the Recent Crisis

During the recent international crisis considerable preparations were made for treating casualties which might occur among the civilian population as the result of gas and bombs used in air raids. Little or no provision was made for those cases of psychosis or neurosis which might arise as a result of stress, and probably in great numbers. This point has been emphasized by various authorities—namely, that the civilian population in future wars would be subjected to as much stress and strain as the result of air raids as the combatants in the front line. In the week following the crisis in September nine patients suffering from nervous breakdowns were seen either at

St. Ebba's Hospital or at St. John's Hospital, St. John's Hill, whose illnesses were definitely associated with the fears attaching to possible war. All the patients were women, and the factors which appeared to determine the illnesses are given below.

CLINICAL OBSERVATIONS

Two of the patients had relatives of military age and, as a result of the last war, were worried regarding their safety. Both these women were at the menopause, both were highly strung and sensitive, and one developed a state of acute excitement, the other a state of agitated depression.

In two other cases the memory of air raids in the last war was particularly vivid, and the fear of further air raids caused an anxiety neurosis in one patient and a state of agitated depression in the other.

Two patients, both married women of about thirty-three years of age and with children of three and two years respectively, became panicky as no provision for protection against gas had been provided for infants. One of these patients developed a state of acute katatonic excitement, while the other showed symptoms of an acute anxiety state.

Another patient who had had a baby three weeks previously became worried when she was to be fitted with a gas mask and also because her husband was likely to be called up for military service. She developed a confusional state and the content of her talk during the illness was mainly concerning the crisis.

Another woman who had had a psychotic illness following dental extraction under gas six years ago broke down when she was fitted with a gas mask. She stated that it had a peculiar smell (this was probably true), and that it had some poison in it, and she became depressed and agitated and showed marked paranoid features.

The last patient was an intelligent girl of 18 who developed a hysterical fugue. She was worried by the continual news bulletins dealing with the crisis which were being broadcast by the B.B.C., with the result that she brooded as to whether it was to be peace or war.

COMMENTARY

Although the number of patients is small, it must be remembered that hostilities had not begun, and of these patients who broke down, with one exception they all remembered the last war with its air raids, which had left them with vivid and terrifying memories. No doubt if hostilities had broken out the number of the civilian population who would have broken down would have been extremely high and would have increased as the younger members of the population who had had no previous experience of warfare began to undergo this new ordeal. Many other stresses, such as the loss of relatives and possibly property, inadequate feeding if a war continues for any length of time, the feeling of insecurity and continual tension, are all added factors in causing a breakdown.

During or just after the crisis several patients who had been discharged from hospital some time previously and had made excellent recoveries were found to be tense and anxious and in a state which foreshadowed another breakdown. As soon as a settlement was reached and the crisis passed they rapidly returned to normal. This suggests that many patients who had previously suffered from a breakdown might relapse under the stress of war and require treatment in hospital in addition to the new cases which would occur.

It appears, therefore, that considerable provision would have to be made in the case of war for treating cases of psychosis and neurosis among the civilian population.

LOUIS MINSKI, M.D., M.R.C.P.,
Deputy Medical Superintendent, St. Ebba's Hospital, Epsom.

Reviews

EXTRA PHARMACOPOEIA VOL. II

Martindale's Extra Pharmacopoeia. Volume II. Twenty-first edition. (Pp. 1,148. 22s. 6d., postage 6d.) London: Pharmaceutical Press. 1938.

The appearance of the second volume of the twenty-first edition of Martindale's *Extra Pharmacopoeia* marks the completion of the first issue of this valuable work which has been edited by the Pharmaceutical Society, and we proffer to the society warm congratulations on the success of its work. Inspection of the book shows that the ever-increasing rate of progress of medical science has imposed a heavy labour on the editors, since it has necessitated rewriting the greater part of the text, even though the last edition only appeared three years ago.

The volume contains a mass of varied information about recent advances in medical science and hence is difficult to describe briefly. The chief sections are as follows: the first third of the volume is occupied by analytical addenda to substances described in Volume I. These accounts include the changes introduced by the B.P. Addendum (1936), the eleventh edition of the U.S. Pharmacopoeia (1936), and the new French Pharmacopoeia (1938). The middle part of the volume is devoted chiefly to problems relating to analytical chemistry and clinical pathology, while the last third deals largely with bacteriological problems. There are, however, articles on a wide range of subjects outside the classes mentioned. A section on proprietary medicines explains the laws, or rather the lack of laws, regulating these substances. The compositions of some 600 proprietary preparations are described. This section is followed by an article on the nomenclature of organic compounds, which gives a very clear account of the principles underlying chemical nomenclature, a subject that appears at first sight to the non-expert to be equally impressive and unintelligible. The article on vitamins deserves special notice, since it gives an account of vitamin chemistry, a subject which has advanced with such remarkable speed during recent years. A short article on chemotherapy takes note of the few general principles that are emerging in this difficult subject. The article includes a description of the structural formulae of a dozen members of the sulphonamide group. Other parts of the volume deal with nutritional standards, poison gases, action of radium and of *x* rays, etc.

These notes indicate the extremely wide field covered by the volume, and inspection shows that great care has been taken to give an adequate account of recent advances in knowledge. Those who refer frequently to its pages will be astonished at the amount of work that must have been devoted to compilation and revision. It will not only maintain, but will also advance, the firmly established reputation of the *Extra Pharmacopoeia.*

THE VENOUS SYSTEM

A Monograph on the Veins. By Kenneth J. Franklin, D.M., M.R.C.P. (Pp. 410; 45 figures. Frontispiece. 27s.) London: Baillière, Tindall and Cox. 1937.

It will be a surprise to many that so much could be found to be said about the veins. The present monograph, however, is very detailed, and deals with every conceivable aspect of the subject from the earliest times right up to the present. In a way it is an essay on physiology and pathology as viewed from the standpoint of the

venous system, and it certainly is a very entertaining and well-written essay, full of detailed knowledge and wide philosophy.

After dealing with the structure, anatomy, comparative anatomy, and embryology of the veins, the author reviews our knowledge of absorption by veins, and of the relation of the nervous system to the veins. It seems clear, from a perusal of this survey, that the innervation of the veins and the relation of this to the various functions of the body are much more important than is generally believed. Another large section of the book is devoted, as might be expected, to the part played by the veins in connexion with the venous return to the heart, and here the author introduces an account of his own investigations carried out with the aid of *x*-ray cinematography with opaque injections. The pressure and movement of blood in the veins are fully treated, though these chapters contain less that is new to the average reader. Finally we have an excellent chapter on clinical aspects of the veins—for example, varicose veins, thrombosis, phlebitis, air emboli—and a chapter on the use of the various photographic techniques in research on veins. This chapter could with advantage have been made longer, because Dr. Franklin has unique experience in this field of investigation.

It is evident that the production of this work has been largely a labour of love on the part of its author, who has every reason to feel satisfied that he has done the work as fully and as well as it could have been done. He has probably a better acquaintance with the ancient literature on the subject than any other person has ever had; we learn from this monograph that his knowledge of recent work is equally comprehensive. The bibliography should not be forgotten—it covers fifty-three closely printed pages, and shows the same close attention to minute detail as does the rest of the book. The printing and illustrating are unexceptionable.

MILD AND ABORTIVE POLIOMYELITIS

Abortive Poliomyelitis. Rein Abortive und nicht-paretische Formen der Heine-Medin'sche Krankheit. By Dr. Med. Otto Gsell. (Pp. 94; 13 figures; 19 tables. RM. 6.70.) Leipzig: Georg Thieme. 1938.

The publicity recently accorded to acute anterior poliomyelitis may not be altogether disadvantageous if it leads to a more intensive study of this dangerous and crippling disease. That it is more widespread and general than is usually supposed is evident from a study of the literature, and it is equally evident that mild and abortive forms often escape exact diagnosis. Dr. Otto Gsell has in this latter respect rendered valuable service to the cause of preventive medicine in laying special emphasis upon the milder forms of the disease—that is, those in which characteristic paralyses are non-apparent. His position as chief physician in the medical section of the Cantonal Hospital in St. Gallen has afforded him exceptional opportunities of investigating a considerable number of both local and national epidemics occurring on the Continent in recent years, and of these he gives an elaborate analytical account, well illustrated by tables and diagrams.

With this material as a background he goes on to discuss the clinical signs and symptoms in full detail, distinguishing carefully between such indefinite manifestations of the disease as non-paretic, meningitic, neuritic, and the frank abortive forms. Pathological anatomy, differential diagnosis, prognosis, prophylaxis, and therapy are also dealt with on the same scale in different chapters, and, together with a review of recent experimental work on immuno-biology, form an exceptionally full account of the present-day knowledge of this disease.

A further noteworthy feature of the publication is the extensive bibliography which occupies the last three closely printed pages. Taken as a whole this monograph is probably the best exposition of this branch of the subject hitherto published.

VITAMIN B_1 IN MEDICINE

Vitamin B_1 (Thiamin) and its Use in Medicine. By Robert R. Williams, Sc.D., and T. D. Spies, M.D. (Pp. 412; 17 figures; 23 tables. 21s. net.) New York: The Macmillan Press. 1938.

This is a carefully compiled, well-written book of reference. It deals with the use of thiamin (vitamin B_1) in the practice of medicine, its influence in partial deficiency and the many minor symptoms arising therefrom, the more well-defined deficiency diseases such as beriberi and closely related diseases, the polyneuritis of sundry diseases, the pathology of the deficiency both in animals and in human beings, pharmacological effects of vitamin B_1 therapy, details of treatment, and an examination of various diets likely to lead to a deficiency of this vitamin. It contains a lucid account of Cowgill's method of estimating the vitamin B_1 requirement of man, an estimate that has had practical confirmation from examination of various "border-line" dietaries and from the therapeutic use of the acid-clay adsorbate of vitamin B_1. The historical and experimental part is also well written. A short chapter on the discovery of vitamins is useful and leads to the more recent work on the differentiation of the B vitamins. Chemical work on the isolation of B_1 by Jansen and Donath and the findings of the author and other workers on the structure of the molecule, chemical features, and finally various syntheses are dealt with in some detail. Further work on the functional groups of the thiamin molecule is discussed and also its use (in the form of the pyrophosphate) as the coenzyme, co-carboxylase.

The methods of assay of vitamin B_1 have been tackled courageously, and the author explains fully that different workers have obtained very different responses in their test animals to the same dose of the vitamin given chiefly as the International Standard. One instance is quoted of the same workers having obtained the same responses to doses of vitamin B_1, in the one experiment from 20 mg. of the adsorbate and in the other from the eluate from 10 mg. only of the adsorbate, and argue from this that the vitamin is never entirely eluated from the clay by the rat. Another experiment is quoted in which an equal response from the rat was supposed to indicate an amount of vitamin B_1 equal to that which produced that response in the earlier experiment. Responses may only be judged to be equal if they are obtained at the same time with groups of animals prepared simultaneously and experimented on simultaneously. Otherwise the response of the rat is taken as the unit and is of no fixed value. The only unit that does not vary in value is a given weight of a given preparation, whether an adsorbate or a crystalline product; and the vitamin content of a substance can only be determined by comparing the response to a given weight of test substance with the response to a given weight of the standard by simultaneous tests on both. The standard must be examined every time a substance is tested if a reliable comparison is to be made. Failure on the author's part to realize this is indicated in the summary to Chapter XVII, in which he says: "For curative tests 1 international unit = 1 to 2 γ of pure thiamin chloride; for protective tests, 4 γ; for tests using animals partially depleted of thiamin but not yet polyneuritic, 1 international unit has an intermediate value." How can 1 inter-

national unit (10 mg. of a particular adsorbate) contain different amounts of crystalline B_1 according to the kind of test for which it is used? Even if it had been proved that it was not wholly separated from the adsorbate (and this is at least doubtful), nothing would alter the fact that a given weight of adsorbate contained a certain constant weight of vitamin B_1.

The rest of the book is devoted to the theories of the part played by vitamin B_1 in physiological processes. It is very interestingly written and should prove most valuable not only to research workers but also to the clinician who is interested in vitamin B_1 from a practical standpoint.

WATER PURIFICATION

Biology of Water Supply. By Anna B. Hastings, M.A., Ph.D. British Museum (Natural History) Economic Series, No. 7a. (Pp. 48. 1s.) London: The British Museum (Natural History). 1938.

Water is one of the essential food components. It is required also for cooking purposes, for the maintenance of personal cleanliness, and for the removal of waste products from houses. A pure and copious water supply is nowadays recognized by all as essential, alike to individual health and communal prosperity. This being so, it is not surprising that the exhibit in the British Museum of Natural History relating to procedures adopted for the purification of water should have aroused widespread interest, and should have created a corresponding demand for the descriptive booklet written by Dr. Anna Hastings for the further explanation of the matters displayed. A re-issue of this brochure on the *Biology of Water Supply*, which now appears, deals with the forms of plant and animal life which are encountered in waterworks and portrays the conditions of life in rivers. An account is given of the treatment of river water by storage, filtration, and chloramination. Reference is made also to wells, springs, and lakes as sources of supply, to the consequences of omitting filtration, to the action of iron bacteria and the corrosion of mains. The work, which is illustrated by drawings and photographs, concludes with a classified list of the plants and animals mentioned in the text and a list of references.

SURGICAL PATHOLOGY

Surgical Pathology. By William Boyd, M.D., LL.D., F.R.C.P.Lond., M.R.C.P.Ed., F.R.S.C. Fourth edition, (Pp. 886; 476 illustrations; 15 coloured plates. 45s. net.) London: W. B. Saunders Company. 1938.

The three textbooks for which Professor William Boyd is responsible have achieved a wide popularity, and it is not surprising that a fourth edition of his *Surgical Pathology* should have been called for, the third having appeared in 1933. Most of the numerous additions which have been made consist of a few lines or a paragraph on some subject not previously mentioned; among the more important are new sections on lymphogranuloma venereum and regional ileitis, and among discussions on theoretical questions which have also been revised that on the aetiology of appendicitis is a useful improvement. There comes a time when the piecemeal method of revision is not altogether adequate; when a paper published fifteen years ago is still mentioned as "recent," that part of the text would benefit from rewriting, the gains represented by modern studies being consolidated in a unified and coherent statement of knowledge. There are few omissions to criticize, but Abel's work on the transport of tetanus toxin should be mentioned, and, if it is desirable in a textbook of pathology to discuss the response of streptococcal infections to different forms of serum treatment, a sentence to the effect that the outlook in this and some other surgical infections has been completely transformed by chemotherapy would not be out of place. In these days of lobectomy and pneumonectomy a chapter on diseases of the lung might also well be added. When other authors would say that lymphosarcoma is highly susceptible to irradiation, Professor Boyd tells us that it responds to this treatment by melting "like a snowball before the fire"; this graphic and engaging style and the practicality and breadth of his outlook will continue to attract many readers to his work.

Notes on Books

A practical, useful, and well-illustrated book entitled *The Health of Mother and Child* has recently been issued by the Corporation of the City of Glasgow, and, through the courtesy of the Corporation, the book has been made available at special rates to all local authorities who desire to use it in their own maternity and child welfare work. The first part deals with the health of the mother and methods of feeding children, and if this small volume were in the hands of most mothers it might help to stop the decline in breast-feeding which has recently given rise to a considerable volume of correspondence in these columns, following the article by Dr. J. C. Spence in the *Journal* of October 8. The mother is given detailed instructions how to wash and to clothe the infant, and the charming illustrations make it impossible for her not to be aware of the correct way of conducting these apparently straightforward operations. At the end of the book are instructions how to make infants' clothes, and there are a few simple recipes—for example, how to prepare barley water, whey, albumin water, etc. More stress might have been laid on the necessity for only drinking milk that has been sterilized either by boiling or by pasteurization.

Quacks' Paradise, by "Sidney Fairway," is a novel which contains an interesting study of the psychology of quacks. The central figure, Dennis O'Callan, starts as a medical student, fails in his finals, and therefore practises without a qualification. The author (a medical man) brings out in an interesting manner how his partial training acts as a handicap throughout the quack's career because he knows the kind of harm he is doing and hence lacks the perfect self-assurance that is essential for success. The novel also has an interesting plot turning on a murder in the garden city which is the quacks' paradise. It is published at 7s. 6d. by Stanley Paul and Co.

Electro-Medical Apparatus and Their Management, by W. E. SCHALL, B.Sc., is published in Bristol by J. Wright and Sons at 7s. 6d. For those who possess a varied equipment for the practice of electrotherapy this small volume, produced by the firm of Schall, will be of interest. It supplies explanations, illustrated by careful diagrams, of the underlying principles of most of the electrical phenomena used in medicine. It should prove of special value to the technician to whom is entrusted the intelligent care of apparatus, and for this purpose it is a useful volume of reference.

In his treatise on asthma Dr. LUIGI TARGON points out that many cases of asthma and urticaria cannot be traced directly to allergy or sensitization to some foreign protein. Many patients have attacks if exposed to cold, excessive sunshine, or changes in surrounding atmospheric conditions such as variations in barometric pressure, change of wind, or altered humidity. Internal environmental changes such as alteration of acid-base equilibrium, and even psychological changes in the emotions or at the menstrual period, may precipitate an attack. In such cases

the author believes that there is a reflex effect through the nervous system on the bronchial musculature and on the bronchial secretion. The reactions through the nervous system are variable and are influenced by the make-up of the patient, especially the constitutional endowment of the endocrine glands. The indications for treatment do not seem to be materially advanced. *Asma Bronchiale e Sistema Nervoso* is published at Padua by R. Zanadni at the price of 20 lire.

The twelfth edition of the *Handbook of Sanitary Law* is edited, like the tenth and eleventh, by Dr. BURNETT HAM. During the seven years which have elapsed since the appearance of the last edition much of the staple public health law of England has been consolidated in various ways. The present issue includes such recent enactments as the Midwives Act, the Public Health Act, and the Housing Act, all of 1936, together with the Factories Act of 1937 and the Food and Drugs Act of 1938. The content of these and other statutes, as well as of sundry regulations, is summarized without obvious compression, heavy type being used with exuberance in certain parts. The new edition, like its predecessors, is intended for the use of candidates for a public health qualification. It is, we think, well suited to meet their requirements. The publishers are H. K. Lewis and Co.; price 7s. 6d.

Professor C. OPPENHEIMER has now reached the tenth part of the supplement to his work on ferments and their action (*Die Fermente und ihre Wirkungen*. Supplement, Number 10. The Hague: W. Junk, 10 florins). In this the description of the zymases concerned with carbohydrate breakdown is completed and the subject of dehydrasis is begun. The mechanism by which glycogen is broken down is one of the most important problems in physiology, and a very clear review is given of the evidence relating to this problem. At the end of this volume the author begins a description of the properties of the flavine ferment which was discovered by Warburg in 1932.

The first issue of vol. 13 of *Acta Psychiatrica et Neurologica* contains six articles, three of which are in English (nervous complications of mumps, practical application of electromyography in diagnosis of tremor, and peripheral nerve lesions in pernicious anaemia); two in German (neurological symptoms in Schaumann's benign lymphogranulomatosis, and ophthalmo-neuromyelitis in Eastern Asiatics, the Netherlands, and East Indies), and one in French (prophylaxis of crime). The publishers are Levin and Munksgaard of Copenhagen; the price of each volume is 25 Danish crowns.

Preparations and Appliances

A RAPID AND ACCURATE METHOD OF HAEMOGLOBIN DETERMINATION

Dr. C. RICKWORD LANE, pathologist, Hampstead General Hospital, London, writes:

Most of the rapid methods of determining haemoglobin in the blood lose in accuracy what they gain in speed, and a really accurate rapid method would be an obvious advantage. Comparative tests have recently been made of a new method by means of the Sicca haemometer. This instrument has not, so far as I have been able to ascertain, been previously described in English journals, though several articles have appeared in Scandinavian journals.

The principle on which it is based is the viewing of varying depths of blood against a fixed glass colour standard. This is achieved by running the blood into a space between an optically worked glass base plate and an optically worked glass bridge or wedge, which is so constructed that the space deepens continuously from left to right. A notch on the bridge fits into a projection on a raised ledge on the base plate, thus ensuring that the glass bridge is in a constant position on the base plate. Two glass colour standards are provided and can be turned into position as required; the light from a small electric round glass bulb is transmitted through both specimen and standard.

Blood is run from the ear or finger into the narrow end of a glass pipette, either by capillary attraction or, if necessary, by means of suction from an open rubber cap at the other end of the pipette. A stainless-steel needle is dipped into the blood for about $\frac{1}{4}$ inch through the wide end of the pipette, thence it is transferred to a bottle of powder supplied with the instrument, and thence, the requisite amount of powder sticking to it, back to the blood, where it is twirled to mix the powder with the sample until the latter reaches a rich magenta colour and a laked appearance. Any blood adhering to the outside of the pipette is then wiped off and the needle removed. If the examination is not to be done at once the pipette can be placed in a special corked glass container and kept in a more or less oblique position for estimation later. The powder used consists of sodium hydrosulphite, sodium chloride, saponin, and sodium citrate. This changes any oxyhaemoglobin to reduced haemoglobin and maintains it as such, lakes the red cells, and prevents coagulation.

In making the estimation the wedge is placed in the correct position on the base plate and blood run in to the space between them by capillary attraction. The base plate is now moved from side to side until the standard is matched. The haemoglobin percentage is then read off on the scale on the right-hand side or on the left according to which standard is being used. For very low haemoglobin levels a second wedge is used which is double the depth of the first, and in this case the observed reading is halved.

Standard scales can be obtained for 100 per cent. haemoglobin corresponding to 16 grammes per cent. haemoglobin or 100 per cent. haemoglobin corresponding to 18.5 c.cm. O_2. Using the latter scale the method has been compared with the ordinary Haldane carbon monoxide haemoglobin method, and gives results which are practically identical, and since there is much less manipulation of the blood it is probable that this method is more accurate.

The advantages gained are the rapidity of estimation (it takes about 30 seconds) and ease of cleaning (the pipettes can be washed through with tap-water and dried inside and out with a cloth, the wedge can be washed under the tap and dried, and the base plate wiped with wool, first dry then damp, and finally dried). For drying the bridge and base plate, soft material not likely to scratch the surface should be used. Another advantage is that haemoglobin values as low as 12 per cent. can be read accurately. Again, as a comparison is always made by artificial light, there is no difficulty with the change from daylight to artificial light such as occurs with the Haldane method, which is particularly trying, especially at this time of the year.

I wish to thank Messrs, Hawksley and Sons for placing one of these instruments at my disposal for testing purposes.

NEW GERMAN PREPARATIONS

We have received the following preparations which are made by C. F. Boehringer und Soehne and marketed in this country by Messrs. Coates and Cooper.

"Validol" is the menthol ester of isovalinanic acid, and is recommended for neurasthenia, hysteria, every kind of anxiety neurosis, fainting attacks, fits, conditions of debility of whatever origin, sea-sickness, etc. "Iminol" contains caffeine, theophyllin, papaverine, and agaricine; it is stated to be a remedial agent for asthma. "Kombetin" is a preparation of strophanthin Kombé in ampoules; each ampoule contains $\frac{1}{2}$ mg. of glucoside. "Digiveron" tablets contain that fraction of the digitalis glucosides which is known at gitalin (Kraft); each tablet contains an amount equivalent to 0.1 gramme powdered digitalis.

THE WAR IN SPAIN

MEDICAL WORK FOR THE REPUBLIC

The medical members of the Spanish Medical Aid Committee arranged a reception on January 18 at the B.M.A. House, Tavistock Square, to meet ten British medical men who have recently returned from service in Republican Spain. Lord Addison, president of the committee, received about 250 guests, and after a conversazione he presided at a meeting in the Great Hall, when four of the returned doctors recounted their experiences of modern military surgery. After Lord Addison's departure the chair was taken by Dr. Janet Vaughan, and questions and discussion continued until a late hour.

The general conditions in which the medical service was carried on behind the Republican lines were sketched by Dr. COLIN BRADSWORTH, who, in January, 1937, was made medical officer of the British battalion. The battalion numbered 550, ranging from trained ex-soldiers to the rawest of recruits, for whom only a short period of intensive training was available. He mentioned one man who served in the battalion until he was wounded, and then it was discovered that he had an artificial leg. The men slept for the most part in crowded billets, and there was a fair amount of minor ailments such as diarrhoea and feverish colds. A mild epidemic of influenza occurred, affecting, however, only those who slept in billets; those who slept in tents escaped. Sanitation was at first a great difficulty but eventually improved, and reasonable washing facilities were provided. There was a medical orderly to each company, with four stretcher bearers, and later on an endeavour was made to arrange that each section should have a medical orderly with stretcher bearers. His own dressing station at first was about a kilometre behind the lines, but later, when hostile aircraft became more numerous, it was necessary to resort to caves or dugouts. The British battalion went into action twenty miles south-east of Madrid, and within a week its strength was reduced from 550 to 200. He added that some drugs were rather scarce, but the dispensaries were stocked with large quantities of medical samples and there was no shortage of dressings. Owing to the war situation it was very difficult to get such simple things as enamelled cups, lamps, and electric torches. The relations with the Spanish medical profession were most friendly.

Organization of a Field Hospital

Mr. DOUGLAS JOLLY described the organization of field hospitals, in which the whole of his two years in Spain were spent. He explained that at the beginning of the war the Spanish Government was almost without a military medical service, this service having gone over to the insurgents. The material that remained was very poor. The Republican army was assisted by 200 doctors and 500 nurses of other nationalities. He had the good fortune to arrive in Spain on the same day as a very good surgical team from Paris. The work at the field hospital was strenuous. While the fighting went on there was no pause between operations. The next patient was being prepared while the operation was taking place on the first. One necessity which was brought home to him was for some foolproof method of marking cases, whether by means of sticking-plaster or of colours—red for most urgent, blue for secondary urgency, and so on; a rule-of-thumb method and one obvious to the untrained person was required. He expressed the view that in a front-line hospital the facility of *x* rays was rather a disadvantage than otherwise. It made one forget one's clinical sense and in the great rush of work rely too much on *x*-ray appearances.

The character of war had changed by reason of mass attacks by aeroplane. The medical officer could no longer sit behind the lines and await his cases. When he first went to Spain a house in the nearest village was taken as a hospital, but soon they were driven to find the biggest house outside any village, such as a large farmhouse or convent, but that also became very risky. Tents were tried but material was not abundant, and it was necessary for all tents to have double walls, not only as a protection against summer heat and winter cold but as a means of concealment. With the single-walled tent it was wholly impossible to subdue the slight glow at night which might attract the attention of a prowling aeroplane. Eventually underground caves—in one cave they had a hundred beds—and railway tunnels were used, and in some instances a hospital train was run into the tunnel and used there as a hospital, with operating theatres at work. Mr. Jolly spoke of the continued improvement he observed during his two years in Spain; the medical service from being a formless embryo became adult. It earned the gratitude of the Spanish people, who would crowd in with food and wood and offers of service. A tribute was also due to the priests and nuns who took some part in the medical work, and to the Spanish surgeons—doctors in civil life—who had themselves built up a very fine medical service, of which the foreign doctors were a part.

Blood Transfusion Service

Dr. REGINALD SAXTON spoke on the use of preserved blood for transfusion, which was largely resorted to in the Spanish service. The need for such a development, he said, arose at the very beginning of the war because there was a great shortage of doctors, and there was also an immense enthusiasm among donors. Institutes dealing solely with the collection, storage, and distribution of blood were set up first in Barcelona, and then in Madrid, Valencia, and several provincial towns. Storage had to be at a temperature of between 0° and 5° C. Not only citrate but glucose, which was said to delay haemolysis, was added. The blood became toxic, under the best conditions, after three weeks' storage, and under bad conditions very much sooner. If on standing a definite rose colour of the plasma was observed it must be rejected as likely to cause a rigor. He drew special attention to a 500 c.cm. ampoule which was invented in Barcelona, containing 300 c.cm. of blood and 200 c.cm. of filtered compressed air. It was customary in Spain to give 1.5 litres in half an hour, and quite a frequent thing to give 0.5 litre in five minutes. The mortality rate among the cases transfused was 60 per cent., but it would have been much greater among the same cases had no transfusion been given. The danger of giving stored blood was not great if elementary care were taken. At one time he was so much disappointed with it because of its liability to produce rigor that he confined his work to direct transfusion, but here again he found rigors not lessened in frequency.

Limb Surgery

Mr. TUDOR HART discussed military surgery, more especially for fractures. The problem in war surgery, he said, was to deal with penetrating and highly infected wounds. Amputation of the upper limb was hardly ever performed; it was found that the limb could nearly always be preserved. In the case of the lower limb, however, incidence of anaerobic infections was much greater than in the upper, and extreme conservatism with regard to amputation of the lower limb might be dangerous. Moreover, the disabling effects of amputation were less conspicuous in the lower limb than in the upper, thanks to the ingenuity of artificial appliances. The technique of amputation generally followed was the two-stage one, the stump being completed later in a specialist base hospital. Mr. Hart expressed the view that just as in the last war plastic surgery was introduced for the face to restore appearance a future war would see the introduction of plastic surgery of the limbs to restore, not appear-

ance, but function. Limb injuries represented 70 per cent. of all casualties, and the tendency to regard limb surgery as a kind of minor job safely to be left in inexperienced hands should be resisted.

Although there were on the platform ten young medical men who have returned from medical service in Spain on the evacuation of foreign personnel by the Republican Government, time could only be found for four of them to speak, but many questions were asked afterwards, the point of special interest being the blood transfusion service.

NEUROSES IN WAR-TIME

LECTURES AT THE TAVISTOCK CLINIC

The third and fourth of the lectures in the series at the Tavistock Clinic on the general subject of neuroses in war-time, with special reference to the civilian population, were given on January 19, both of them by Dr. H. CRICHTON-MILLER, the first being on "Conversion Hysteria" and the second on "Anxiety States."

Conversion Hysteria

In his first lecture Dr. Crichton-Miller said that the problem to be discussed was to get individuals to adapt themselves to completely unfamiliar and extremely exacting conditions in the environment. It was generally assumed that the martial type of personality was capable of such adaptation, while the martial misfit should never be called upon to do anything unsafe. Modern war conditions had changed this idea to a great extent, with the probable exposure of the civilian population to attack by the enemy. The question was how far the civilian population would stand up to the demands upon its moral resistance.

Proceeding to discuss the individual's temperament and his emotional control and development, he mentioned various types, as, for example, the feeling type as opposed to the rational type, and the conceptual type as opposed to the perceptual. The Australian and New Zealand soldiers in the last war were excellent examples of the perceptual type, realists to the *n*th degree, unappalled by the prospects of pain and suffering, and extremely valuable men to the army. On the other hand the conceptual type, as illustrated by the Latin races, tended to collapse more quickly owing to the capacity for imagining and visualizing what had not yet happened. The great lesson to be learned from the study of temperamental adjustment and maladjustment was the careful pre-selection of those who were to be sent into the danger zones.

With regard to the emotional status of the individual, there were many who were well balanced emotionally and well fitted to meet excessive demands upon their adaptation, but who for transitory reasons were maladjusted. Different emotional states could influence the reaction of an individual to the demand for control. The degree of instability which was attributable to temperamental causes as opposed to that which was due to transitory toxic or other somatic causes must be ascertained, because there was a difference between the manner in which each set of cases should be treated.

In all war cases, whether relating to the civilian or the military population, the question of exhaustion had to be taken into consideration, particularly as it reinforced two great somatic factors, toxaemia and air concussion. Septic tonsils or other septic conditions and a certain amount of dysentery were very common in the trenches in addition to exhaustion; also, a very large number of men were affected in a much greater degree by air concussion as a result of their exhaustion. He hoped that during the next war some blood sugar observations might be made in such cases, because the effect of emotional exhaustion as opposed to the effect of toxicity or air concussion could be understood and interpreted in terms of blood sugar much better to-day than twenty years ago.

The individual's emotional development was a very important subject for consideration and brought in the analytical point of view at once. The emotional pattern of childhood was likely to make a difference to every reaction, not merely in war but in peace. Unfortunately the world was not ready to realize that emotional fixation and bondage in early years was apt to be a millstone around the neck of the individual in adult life, and public opinion was not ready to allow those questions to be put which would enable an assessment to be made whether an individual was likely to react normally with self-control and self-discipline to the demands of war.

In a democracy lip service was paid to intelligence, but it was not realized that intelligence was not as important as emotional control. The people who had reached self-discipline were not necessarily the same as those who were well-disciplined in the external sense. In any army the show troops were those who had an adolescent personality in the ranks, individuals completely "condition-reflexed" to command, who could be relied on to behave in a solid way for so long as they were a solid body. That was totally different from the individual whose self-discipline and control over his emotional life were independent to a great extent of social support and whose initiative and capacity to think rationally were as nearly as possible unconditioned by the situation in which he found himself.

One final word upon this background related to the question of experience. In war, when men first underwent shelling they reacted pretty badly, but subsequently there was a great improvement. This would apply to the civilian population; the worst results might be expected on the first air bombardment, but later an improvement might be hoped for. In all normal reactions of the individual to any form of threat or menace the results were apt to be thought of in terms of concussion, trauma, fear, and so long as this was so only part of the picture was seen, because the picture with which he was going to be confronted was a much more complex one, one in which far more than the resultant effect would be notably present. Purposive reactions would become established and superimpose themselves upon the first and immediate biological reaction of fear. The "fight or flight mechanism" which belonged originally to the biological personality might be traced afterwards right up to the pensions board. Here was the man in the trenches reacting violently to the first explosion, and then passing through casualty clearing station, base hospital, and so on, until he reached home, during which pilgrimage his reaction became less and less somatic and more and more complex, until finally it was extremely human and purposive. The reactions which followed upon the first experience of biological fear tended to become those significant of escape from a future fear. The orientation of the individual gradually altered from its domination by the fear which was perceptual at the moment to the fear that was conceptual and future.

Passing to a consideration of shell shock, Dr. Crichton-Miller said that most medical officers up to the armistice had a routine disposal of these cases, some of them concentrating on the organic side and some on the manifestations, some being actuated by sympathy and others by severity. The war provided many thousands of cases in which physical factors coincided with fear resulting from war conditions. Many of the men had septic teeth or tonsils or other conditions which were intensified by life at the front. They were all afraid; most of them knew it, but not all; some admitted it, but some did not; and all of them wanted to get home, some of them trying to do so deliberately but most of them unconsciously. It was always easy to recognize the fear and treat it according to one's outlook, but it never was or would be easy to evaluate the measure in which the symptoms arose for defence purposes.

A medical officer giving a diagnosis of war neurosis might be asked the following questions: "How far do you suppose that a defence mechanism comes into this case, (*a*) conscious, (*b*) unconscious? How far do you suppose air concussion, cerebral concussion, or burial has been experienced?" That was going to be very important, because nearly all the cases of shell shock claimed to have been buried, and it was necessary to establish as an objective fact how far burial had happened and how far it had not. Other questions would relate to toxic factors, and to the extent the man was considered constitutionally incapable of rendering adequate service. The medical officer might also be asked to advise on disposal, a serious problem in dealing with the civilian population, where probably the medical officer would not have much choice, though he might ask himself whether a particular neurotic should be recommended for rest with isolation, rest with distraction, or rest with occupation; whether he needed the services of medical, surgical, or psychiatric experts; whether a given patient should be evacuated to a safe region, or a given air warden be reclassified or discharged. Perhaps these possibilities could not be set out in more exact terms, but at the same time doctors should know their own minds for the sake of clear thinking.

Dr. Crichton-Miller concluded with some remarks on anxiety neurosis, hysteria, and neurasthenia in shell-shock cases.

Anxiety States

In his second lecture Dr. Crichton-Miller dealt with anxiety states. Anxiety, he said, could be described as an emotional condition the only expression of which was given through the autonomic nervous system, whereby trembling, blushing, sweating, and palpitation were produced. When a patient complained of tremor one registered whether the tremors were fine, in which case they suggested hyperthyroidism or anxiety; or gross, in which case there was a purposive element involved, the central nervous system and not the autonomic was at work, and a hysterical subject would probably be found. But there were a very large number of cases in which both pictures existed. A thoroughly frightened person might have had his symptoms from the beginning tinged with a hysterical element, or a person who had begun with a state of pure anxiety might pass to a hysterical condition. An example of this might be cited in the case of a man in the war who had been blown up and had his arm broken. At the dressing station his arm would be set, he would be made comfortable, and the anxiety symptoms would pass off. But later at the base hospital, when the surgeon suggested that he would soon be ready to return to the trenches, the functional symptoms would reappear, more purposively than when the event happened, and be directed to a conceptual danger, to the possibility of re-experiencing danger, instead of being the result of a danger already experienced.

Most doctors during the war were able to recognize the deliberate consciously purposeful tremor of the malingerer as opposed to the unconsciously purposive tremor of the hysteric, and as distinct from the resultant and non-purposive tremor of the anxiety state. If one thought in terms of tremor one could get the three pictures.

The first step in differentiating the malingerer from the hysteric was the history. The hysteric gave himself away every time in the way he told his story, the dramatic exaggeration was so naïve. The malingerer did not do that. He gave his history much more guardedly. With the hysteric there was a stronger environmental factor than with the anxiety case, but in both of them psychotherapy ought to be successful. Dr. Crichton-Miller analysed the processes by asking any of his audience to imagine that they had been exposed to a high explosive, emerging with a thick head and a fine tremor in their limbs. Their first emotion would be one of self-pity, and gradually the thought would form in their minds, were they going to be sent back into the area of danger? Their line of thought might well be, "If the medical officer realizes how rotten I feel he will not send me back. If he notices this tremor he will not send me back. Let me, then, see that this tremor does not go unnoticed." Thus the hysteria began. The point at which the resultant anxiety symptom became exploited for the hysterical purpose of the limelight was the point at which the medical man must go right down on his diagnosis with a fine razor edge.

What was the therapeutic problem for the anxiety case? The first thing the anxiety case needed was security. Dr. Crichton-Miller had no sympathy for the school which believed that with a sufficient use of the court-martial 95 per cent. of the cases could be returned to the trenches within ten days. The case must in the first place be treated with security, reassurance, and protection. Neither theoretically nor from his experience of civilian work could he get away from that. Much more could be done for such cases if there were time and opportunity. It might be that the transforming experience could be given them of discovering that their fear reactions under high-explosive shelling were based upon and conditioned by a pattern that they acquired when they were 5 years old. If one had the opportunity to do it, the probability was that a man who had been an anxiety case could be sent back to the danger zone prepared really to see the thing out. But there were not enough enlightened people to do this work for the thousands of patients who would be thrown on their hands in the event of war, and they must do the best that circumstances would permit.

The civilian patient, assuming that he was more or less a "passenger," could be disposed of with a lighter heart. If it was an anxiety case, let him be sent to a situation of rest and safety. If a hysterical tendency had already been manifested the situation was not so simple. The reactions of the civil population would be most important during the first air raid. It was important to spread far and wide the idea that other civilians had gone through this same thing, and that it was possible to get used even to this hellish manifestation of warfare upon harmless civilians. After the first onset of fear there were compensation phenomena, and the important thing was to give such people a sense of responsibility. The degree to which responsibility could be distributed in the essential services and the manner in which people were to be allowed, within reasonable limits, to use their own initiative when in danger was a major problem. The more freedom and activity that was given to the individual in any given job, the better; the more a man was made immobile and dependent on superior orders, the more chance was there for anxiety to develop. Pre-selection of the individual for his job was a primary need. He felt that members of the medical profession were to be congratulated in that in such an emergency they would have plenty to do. Work at the dressing station was not a situation in which anxiety was likely to develop. In this connexion he made a reference to "battle dreams." In the last war one of the things most indicative of recovery in this class of case was the cessation of battle dreams. The battle dream represented not only biological but social fear; it represented what the anxiety case was striving to repress all the time, and if the man could be got to put his feelings into words, even to a nursing sister, the mere effect of talking it out was a great help. With the free expression of the fears of the anxiety patient much was accomplished towards the removal of those inhibitions which had so disastrous an effect upon his mind and behaviour.

In response to a Parliamentary question the French Minister of Public Health has recently issued the statement that there are as many as 4,388 persons of foreign nationality housed in French mental hospitals. This list is headed by 1,116 Italians, 982 Poles, 546 Russians, 352 Spaniards, and 243 Belgians. There are only sixty-four British subjects on this list.

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SECTIONS IN CAMERA

The Royal Society of Medicine is in essence a federation of twenty-three Sections, many of which existed as separate societies before the amalgamation in 1907. It has a written constitution, providing for Fellows of the whole Society and members of individual Sections, and it is ruled by a Council elected on a composite franchise representing both the Society as a whole and the constituent Sections, which are autonomous, subject to financial and general arrangements made by the Council of the Society.

Until a short time ago all meetings of the Sections of the Royal Society of Medicine (with one exception) were open to representatives of reputable medical journals and (subject to certain rights in the full text of papers, which are now reserved to the *Proceedings* of the Society) the form and content of reports of meetings were left to the good sense of the reporter in the first instance and to the judgment of the editor of the journal concerned. Any request from the chairman or from a speaker that something should be treated as confidential was respected, and we never heard of any breakdown in this unwritten agreement. As in every other public or semi-public assembly there have been speakers who thought themselves neglected by the Press and complained that others received too much prominence in the published reports; but, generally speaking, the open method has worked, and (if we may lift the veil) the *British Medical Journal* has had innumerable unsolicited compliments from Fellows of the Royal Society of Medicine as well as from other London medical bodies upon the skill and discretion of its expert representative. If any speaker is misreported, whether through his own fault or not, a correction is printed on request.

It is not possible to follow the same plan with societies outside the metropolis, and for such occasional accounts of their meetings as appear we are indebted to the reporting secretary or other officer who collects and prepares summaries and submits them for publication at varying intervals after the event. But in either case, whether the report is furnished by a professional journalist of our choice in London or by a secretary of the society in Scotland, Ireland, or the Provinces, the final decision on what shall appear in print is in the editor's hands, and the governing considerations are the general interest and importance of the matter and the space available. This has been so well understood and appreciated for so many years past that readers might think it the natural order of things which scarcely needed explaining and certainly called for no defence. We and our predecessors—and the same, we know, can be said by the *Lancet*—have held and hold that the Fellows of the Royal Society of Medicine (and of the Medical Society of London and other semi-public bodies that exist to promote the science and art of medicine) are in some sort trustees—that is, they have a duty to give as well as to receive information and experience for the benefit of medicine at large and of the public whom medicine serves. Within reasonable limits their spoken contributions to the common stock of opinion and knowledge should be accessible to the whole profession, not merely to colleagues of their own society; and the weekly medical newspapers form the obvious, indeed the only, means by which this can be done effectively and promptly. There are of course controversial topics on which free debate may languish in the presence of "outsiders"—that is, representatives of the lay press—but very few discussions at the Royal Society of Medicine can be so delicate that the doors of the meeting room must be closed to responsible representatives of responsible professional journals.

It would be most unfortunate if the large medical societies got into a habit of secrecy in their scientific and clinical meetings. Yet there appears to be a movement towards this in some Sections of the Royal Society of Medicine. A number of private medical clubs and associations exist for private interchange and discussion. Debates *in camera* at No. 1, Wimpole Street ought to be extremely rare, and the reasons for them should be made plain on every occasion. We have no intention of "gate crashing." But the medical newspapers, having a larger and more direct responsibility to the profession than the Fellows and members of the Royal Society of Medicine, must not let the position go by default for lack of a little plain speaking. It would be easy to ignore the Royal Society of Medicine in these columns for a time, merely ceasing to announce or report any of its meetings until the Fellows and members of all the Sections became aware of the reason and rose up and asserted themselves. For the moment it may suffice to give them this hint of a tendency of which most of them probably know nothing; and to await their reactions towards a veiled threat to the liberty of the medical press, which is bound up with the liberty of the profession and therefore with its power to serve the public.

REGULATION OF ARTERIAL PRESSURE

"La fixité du milieu internal est la condition de la vie libre" has probably been the most productive of Claude Bernard's aphorisms. Physiological research of the present century has shown the precision with which the normal body maintains the constancy of the physical and chemical factors which comprise its internal environment, and clinical research has proved how often disease leads to a disturbance in this normal relationship. But in most instances, and particularly in regard to the chemical composition of the blood, we are still abysmally ignorant of the exact mechanisms by which the body achieves this regulation. Largely as a cloak to this ignorance the conception has been formed that each aspect of the internal environment is regulated by a collection of cells in the central nervous system briefly described as a "centre," and otherwise obscure physiological and pathological phenomena are often conveniently attributed to the vagaries of these cells. There is, however, little concrete evidence to suggest that the central nervous system ever behaves in quite the way implied. The researches of Sherrington and his pupils have demonstrated that in the co-ordination of muscular movement the central nervous system acts as an integrator, receiving information about the internal or external environment from specialized end-organs or "receptors" and transmitting to the effector structure, such as muscle, the appropriate response. And it would not seem unreasonable to suspect that most of the functions of the body under nervous control are governed in an analogous manner. An instance in point is the regulation of the arterial blood pressure.

Most of us were brought up to believe that this regulation is effected by the "vasomotor centre," and the experiments of Anrep and Starling[1] seemed to provide proof of the correctness of this hypothesis. They showed that alternations in the arterial pressure of the head of an animal perfused separately from the trunk lead to an opposite alternation in the arterial pressure in the trunk provided that the nervous pathways between head and trunk remained intact. It was not long before this evidence met a challenge, for at about the same time H. E. Hering[2] of Cologne demonstrated that the slowing of heart and fall in arterial pressure after digital pressure in the carotid triangle of the neck were not caused by direct stimulation of the vagus, as was then thought, but were reflex effects of stimulating the carotid sinus, the name given to the bulbous expansion of the internal carotid artery at its origin. Shortly afterwards Florey, Marvin, and Drury[3] showed that Anrep and Starling's results were due to the carotid sinus being included in the head circuit, and that if this were excluded changes in pressure in the head were not followed by opposite changes in the trunk. Since that time knowledge of the regulation of the arterial pressure has grown apace, and has recently been summarized by C. Heymans[4] of Ghent in his Dunham lectures at Harvard. It is now known that the arterial pressure is regulated largely by a reflex mechanism: the receptors, which are sensitive to stretch, lie in the arch of the aorta and in the carotid sinus; the effector mechanism is chiefly the sympathetic nervous system and its outpost the adrenal medulla; the reflex arc passes through the vasomotor centres in medulla and spinal cord. Normally impulses are constantly passing up the depressor nerves from the aorta and up the carotid sinus nerves. When the arterial pressure rises, more impulses pass up these nerves and lead reflexly to slowing of the heart and to vasodilatation. When the arterial pressure falls, fewer impulses ascend, the heart quickens, and the peripheral vessels constrict. In this simple way the arterial pressure tends to be maintained constant. Although the chief receptors concerned in the regulation of the arterial pressure lie in the carotid sinus and arch of the aorta, Heymans and his colleagues have shown that there are others of secondary importance, probably chiefly in the splanchnic area. Gammon and Bronk have found that impulses ascending the splanchnic nerves from the Pacinian corpuscles are dependent on the level of the arterial pressure.[5]

In his fascinating critique of Claude Bernard's dictum quoted at the beginning of this article, Barcroft[6] points out that the precision with which the statement begins contrasts almost comically with the vagueness of its end. Asking himself what is this "free life" which the constancy of the internal environment makes possible, he concludes that it comprises chiefly the highest activities of the brain, for these are the first to be upset when the internal environment is changed. It is interesting to note here that the vessels of the brain are the only vessels in the body which are not called on to vary their diameter when an alteration of the arterial pressure is threatened. This elaborate and exact mechanism thus seems to exist chiefly for the purpose of supplying the brain with an adequate supply of blood at a certain pressure. Although the brain seems to have first call on the blood available for distribution, other needs of the body are not neglected. Rein and his colleagues[7] have

[1] *Proc. roy. Soc.*, B, 1925, **97**, 463.
[2] *Die Karotissinusreflex aus Herz u. Gefässe*, Dresden, 1927.
[3] *J. Physiol.*, 1928, **65**, 204.
[4] *New Engl. J. Med.*, 1938, **219**, 147.
[5] *Amer. J. Physiol.*, 1935, **114**, 77.
[6] *Features in the Architecture of Physiological Function*, Cambridge, 1934.
[7] *Ergebn. Physiol.*, 1931, **32**, 28.

shown that in general the vasoconstriction evoked by a threatened fall in arterial pressure tends to affect quiescent organs; it does not affect the muscles when these are active or the skin when the animal is very hot.

Such in brief is the modern conception of the way in which the arterial pressure is normally regulated. The mechanism also must play a large part in the control of arterial pressure under pathological conditions, and particularly as a protective mechanism in haemorrhage and in shock. Thus it has been demonstrated that in an animal deprived of both carotid sinus and aortic nerves the loss of 10 per cent. of the blood volume is followed by an abrupt and ultimately lethal fall in the arterial pressure, whereas a similar loss in normal animals produces only a transient hypotension.[4] Of greater interest perhaps to the clinician would be the recognition of states in which there is some primary disturbance in these mechanisms regulating arterial pressure. One has been demonstrated by the researches of Weiss and his colleagues,[8] who have described the occurrence of syncopal attacks usually occurring on movement which may be reproduced by digital pressure on the carotid sinus. In such patients, with an evident hyper-excitability of the carotid sinus mechanism, the fits may be abolished by section of the carotid sinus nerves. Heymans[9] also still holds the view that essential hypertension in man may be due to a lessened excitability of the carotid sinus and aortic mechanism. In this view he now stands almost alone, for the experiments of Gammon[10] and of Pickering and his co-workers[11] have shown that the carotid sinus mechanism remains active, and apparently normally so, in essential hypertension in man. But these new conceptions of the mechanisms that regulate arterial pressure have a bearing on the problem of hypertension. The relegation of the vasomotor centre from the position of dictator to one of a routine collector and transmitter of nervous impulses makes it less than ever likely that pathologically raised arterial pressure is the result of a change in this part of the brain. The problem of high blood pressure in man was most ably reviewed by Dr. G. W. Pickering in our issue of January 7.

[8] *Medicine*, 1933, **12**, 297.
[9] *New Engl. J. Med.*, 1938, **219**, 154.
[10] *J. clin. Invest.*, 1936, **15**, 153.
[11] *Clin. Sci.*, 1935–6, **2**, 193.

LEAD IN FOOD

The interesting case recorded by Dr. G. E. Beaumont and Dr. R. Wyburn-Mason in our present issue (p. 150) may help to remind many readers that lead poisoning is a condition that has to be considered in the differential diagnosis of obscure complaints. The patient in this instance was temporarily blind and feverish, had severe abdominal pain and jaundice, vomited, and had fits. Lead was found to the extent of 1 part in 10,000,000 parts of urine and stippling of red cells was observed on examination of the blood. The source of the poisoning was traced to the water supply. Water in the patient's home was pumped from a well through lead pipes. In a recent publication issued by the Ministry of Health[1] G. W. Monier-Williams shows that the widespread distribution and use of lead in a variety of forms make contamination of foodstuffs with it inevitable. Susceptibility of different persons to lead varies widely, and it has been suggested that the daily absorption of small amounts may lead to a vague debility in the more susceptible. Among the sources of greater or less contamination of food with lead are the employment of lead-containing alloys, solders, enamels, and glazes in plant and vessels used in the manufacture, storage, transport, and cooking of food; the use of certain organic acids—for example, citric and tartaric—which have been crystallized in lead pans; the use of acid calcium phosphate (prepared from bone ash in lead vessels) in baking powders; the spraying of fruits with insecticides containing lead arsenate; the presence of "natural" lead in shell-fish and crustacea derived from sea water. A large number of analyses for lead have been made in the Foods Laboratory of the Ministry of Health with a method delicate enough to detect 0.002 mg. of lead—that is, 0.4 part per million—in a sample of 5 grammes. Fresh, canned, and bottled, dried and crystallized fruits, vegetables, cereals, milk foods, fish foods, meat foods, condiments, beverages, and a miscellaneous group comprising eggs, sugar, custard powders, turmeric, etc., were studied. Whereas many foods contained less than 0.2 to 0.4 part lead per million, there were several in which the lead content was by no means insignificant. The following foodstuffs were noteworthy, the lead content in parts per million being in brackets: self-raising flour (2.4), sardine paste (8.3), imported beef-bone (6.8), a curry powder (21.6), ground cloves (4.0), China teas (4.4–6.1), Indian tea (10.2), baking powder (containing alum and phosphate) (7.1). There is little doubt that with suitable precautions the contamination of food with lead can be reduced to negligible proportions, and, indeed, in most foods examined this has been attained. A certain amount of lead is absorbed daily from sources other than food—for example, there is evidence that 0.2 mg. lead is taken in daily in drinking water due to the use of lead pipes and that about 0.08 mg. is the average daily amount inhaled in the form of dust by those who live in towns. The figure for lead intake from an average diet is about 0.2 to 0.25 mg. (both English and American workers), thus giving an approximate daily total lead intake of about 0.5 mg. The daily disposal of lead as estimated from various published sources approximates to 0.5 mg., distributed as follows: 0.05 mg. stored in the bones, 0.4 mg. excreted in the faeces, and 0.05 mg. excreted in the urine. Thus there is a daily exchange of some 0.5 mg. lead. Although it is not possible to lay down

[1] Ministry of Health Report No. 88. *Lead in Food*, by G. W. Monier-Williams. H.M. Stationery Office. (Price 1s.)

a precise upper limit to the safe amount of lead which may be daily ingested in food, Monier-Williams concludes that 1 mg., or possibly even less, must be regarded with suspicion. The important consideration, however, is what effect the lead in food has upon the total intake of lead, and as the amount absorbed from sources other than solid food is already not negligible every effort must be made to reduce the lead in food to minimal proportions. It is well known to medical men engaged in the supervision of the health of workers employed in industries with a lead hazard that some men react very quickly to exposure to minute amounts of lead-containing products. Although this fact is usually explained by the statement that such individuals are hypersensitive to lead, it is not clear what precisely the mechanism of this hypersensitivity is. It is possible that these persons when in non-industrial conditions would develop apparently inexplicable symptoms if their diets included foods with a relatively high lead content—for example, sardines—and such persons are by no means rare. Women are notoriously sensitive to lead, and it might, in obscure cases of abdominal or nervous symptoms, be worth while to consult the Ministry of Health results on the lead content of foods in the elucidation of possible dietary contributions to the symptoms observed.

RADIOLOGICAL DIAGNOSIS OF THE PNEUMONOCONIOSES

The study of occupational diseases of the lungs forms a branch of industrial medicine the importance of which it is difficult to exaggerate. Asbestosis, though more recently recognized, like silicosis now comes under the Workmen's Compensation Acts, and the occupational factor is looming increasingly large in other pulmonary conditions. Fawcitt,[1] in a recent review of occupational pulmonary diseases in agricultural workers, describes various types of mycotic infections in hayworkers, grainworkers, stablemen, and gardeners, horsemen, and cattlemen. He also refers to the infections caused by the *Bacillus abortus* of Bang, and to anthrax, glanders, and hydatid cysts. Paprika workers have recently been shown to develop a pulmonary condition that has been ably described by Franz v. Kováts,[2] and even fluorine intoxication, according to Raj Roholm,[3] may affect the lungs. It is generally admitted that the diagnosis in all these cases must largely be based on radiographical appearances. In December, 1937, the subject was amply discussed in a series of papers read at the annual congress of the British Institute of Radiology. These papers have now been published[4] and several important conclusions may be drawn from a perusal of them. Since the radiological diagnosis must be correlated with the occupational history, a knowledge of the minutiae of each occupation is essential in order to decide whether the actual work the patient is doing exposes him to the dangerous dust. The changes seen, being those of pulmonary fibrosis, are not always characteristic, but they generally pass through stages of increasing severity. Duration or severity of contact cannot always be correlated with the extent of the pulmonary changes; the susceptibility of the individual also seems to play a part. Discussing silicosis in pottery workers, Kemp Harper[5] suggests that illnesses such as acute bronchitis, bronchopneumonia, influenzal pneumonia, etc., affecting the workers before or during employment in the industry probably weaken certain areas of the lung parenchyma, so that confluence may be more liable to occur in these weakened areas. This may also account for the fact that men employed in the same type of work and for the same length of time show completely different pictures. Another practical point is brought out by Sparks[6] in connexion with asbestosis. He states that it may be impossible to recognize the disease radiographically in its early stages; when radiographical evidence of fibrosis is present the lesion is already advanced. Diagnosis at an earlier stage is facilitated by taking radiographs while the employees are symptom-free. Brailsford[7] emphasizes that with more careful study it should be possible to recognize by *x*-ray examination damaged lung tissue in apparently healthy workers, and so permit of their removal from injurious processes of whatever nature before irrevocable damage has been done. A final point to be noted is that for interpretation of the early changes, which may be almost indistinguishable, a satisfactory standard technique is necessary, and a radiograph of the patient's lungs taken before or soon after beginning his occupation is of great assistance for comparison. The *x*-ray examination of all such employees at entrance into industry, and periodically afterwards, appears more than ever an essential to the progress of industrial health.

SYPHILIS OF THE LUNG

Syphilis of the lung, or rather acquired syphilis of the lung diagnosed during life, is so rare that the two cases recently recorded by Bruce Pearson and de Navasquez[8] are well worth study. Pulmonary involvement in the form of interstitial pneumonitis is not uncommon in congenital syphilis, but acquired syphilis affecting the lungs yields such vague signs and symptoms that it is usually not recognized till a post-mortem examination is carried out. Nevertheless, the matter is of importance, since the differential diagnosis is chiefly from pulmonary tuberculosis, and treatment, if it is to be successful, should begin early. Of the two cases described the first was that of a man, aged 59, whose main symptoms were shortness of breath and precordial pain; a radiograph of the lungs showed opacity of the lower part of the right upper lobe and a large shadow at the left root. At necropsy there were found an

[1] *Brit. J. Radiol.*, 1938, **11**, 378.
[2] *Die Lungenerkrankung der Paprikaspalter*, 1937, Leipzig, J. A. Barth.
[3] *Fluorine Intoxication. A Clinical-Hygienic Study*, London, H. K. Lewis (agents), 1937.
[4] *Brit. J. Radiol.*, 1938, **11**, 345.
[5] *Brit. J. Radiol.*, 1938, **11**, 354.
[6] Ibid., 371.
[7] Ibid., 393.
[8] *Brit. J. vener. Dis.*, 1938, **14**, 243.

aneurysm of the aorta and firm wedge-shaped areas in both lungs, that in the right lung containing several gummata. The second case was that of a woman, aged 42, who complained of cough and dyspnoea and showed clinical signs of consolidation of the left lung; bronchoscopy revealed syphilis of the trachea and left bronchus with much narrowing of both. The patient died, but there was no necropsy. Tertiary syphilis may affect the lung by invasion of the pulmonary interstitial tissue from the hilum, as in the first case, or by extension from a syphilitic lesion of the trachea or bronchi, as in the second case. In the first group there is a pneumonic process which leads to consolidation; this may clear up under adequate treatment, but if necrosis occurs gummata may form with subsequent cavitation. Organization of the pneumonic or gummatous processes leads to fibrosis, and when this has taken place treatment will not restore the lung to normal. In the second group the lesions are mainly the result of gummatous bronchial obstruction, and the signs will be those of bronchiectasis or fibrosis. The authors point out that in syphilis of the lung the well-recognized diffuse peribronchial fibrosis, which often has a lobar distribution and which was shown in their first case, can only be the result of an acute inflammatory condition. The authors conclude that acute syphilitic pneumonia does occur and is primarily interstitial, leading either to the formation of gummata or to chronic interstitial fibrosis. It is also suggested that pulmonary syphilis is always associated with syphilitic aortitis. The difficulty of diagnosing pulmonary syphilis from tuberculosis or cancer is obvious, and most stress should be laid on the presence or absence of tubercle bacilli, the serum reactions, the radiological appearances, and the effect of anti-syphilitic treatment.

THE WATER-HAMMER PULSE

The descriptive titles used in medicine and pathology, however graphic they may seem to be, are sometimes open to criticism on considerations of good taste or scientific accuracy—for example, the resemblance to foods, as in the pea-soup stools and prune-juice sputum, or a tumour the size of a lump of chalk, and a pulmonary cavity as large as a peeled walnut. Such objections do not apply to the water-hammer pulse of aortic regurgitation, but the comparison of the collapsing pulse to the sensations experienced on handling a once familiar but now long-forgotten toy does not appeal to the vast majority of modern medical men who have not the faintest acquaintance with a water-hammer. How the expression water-hammer pulse came into use has recently been discussed by George Dock, at one time Professor of Medicine at Washington University, St. Louis. Like Sir Dyce Duckworth at St. Bartholomew's Hospital, he kept a water-hammer in his wards to show successive batches of clinical clerks, but on trying to obtain another specimen was denied the possibility. The term was not employed by Sir Dominic Corrigan, whose name has been attached to the pulse as well as to the disease. Professor Dock first traced the use of the phrase back to 1876 by A. L. Galabin, a classical Fellow of Trinity College, Cambridge, a pioneer in sphygmographic tracings, thus following in the steps of Wilkinson King (ob. 1847) and his sphygmometer at Guy's; Galabin was an obstetric physician to Guy's Hospital. Later it appeared that in 1852 in the *Guy's Hospital Reports* G. Hilaro Barlow wrote on "the splashing or water-hammer pulse." It might thus seem probable that one of the popular teachers at that great medical school had been in the habit of using the term. But in his lectures on the *Principles and Practice of Physic* (1843) Sir Thomas Watson wrote: "This pulse always reminds me of the well-known chemical toy, formed by including a small quantity of liquid in a glass tube, exhausted of air, and hermetically sealed. On reversing the tube the liquid falls from one end of it to the other with a hard short knock as if it were a mass of lead." It seems doubtful if the origin of the now out-of-date "water-hammer pulse" will be traced further back, for Corrigan's description of aortic regurgitation was in 1832, or but a short time before.

OPIUM PRODUCTION AND THE LEAGUE OF NATIONS

It is hoped that at the next session of the Advisory Committee on Traffic in Opium and Other Dangerous Drugs further progress will be made with drafting the promised convention on the limitation of the production of opium. It is now some years since both the Council and Assembly of the League of Nations affirmed their conviction that cultivation of the opium poppy ought to be limited, thereby reducing the excess of production which feeds illicit traffic and tends to neutralize the objects of the previous conventions of 1912, 1925, and 1931. When the Advisory Committee at its session last summer had before it the report of a preparatory committee on the main basic principles for the new convention the chairman, M. Delgorge, spoke of the complete success which had attended their labours. He considered that an important step had been taken "towards the final goal at which we are aiming—namely, the suppression of the abuse of narcotic drugs." The new convention, he said, "will make possible the final suppression of opium-smoking in countries and territories where it is still authorized." Even the representative of Turkey, one of the chief opium-producing countries, promised cordial co-operation in laying the foundations of a great "humanitarian undertaking, which would stand out in the annals of the League." He held that "the future convention should supplement the gaps in the 1925 convention." The representative of India (Mr. Nind), however, reminded the committee "that the use of opium in India was not confined to scientific and medical needs. . . . The fact that opium-eating was allowed in India and that a large quantity of the drug was produced there for that purpose was," he held, "not a menace to others." The Government of India considered that "it was not

feasible to limit the use of opium to scientific and medical purposes." The representative of the United States (Mr. Fuller) felt that "some measure of control over all forms of opium-poppy cultivation would have to be considered." He desired to replace the word "might" with "shall" or "must" in the statement of the main principles of the convention. He added that the United States of America would take only a lukewarm interest, if any interest at all, in any conference which was not prepared to consider controlling the opium poppy cultivated for any purposes whatsoever. It would seem not improbable that much the same division of opinion may arise when the draft of the new convention is discussed as arose in the conferences at Geneva which preceded the adoption of the convention of 1925—a rift which led to the abstention of the delegates of China and the United States. The secretariat of the League has reported to the Advisory Committee the extent to which the previous conventions have been adopted. Thus sixty sovereign States have ratified the Hague Convention of 1912, fifty-four are parties to the Geneva Convention of 1925, and sixty-four to the Limitation Convention of 1931. The convention of 1936 for the suppression of illicit traffic had, until lately, not received ratification by ten members of the League, which is needed for its entry into force.

MEDICAL WAR EMERGENCY PLANS

A conference of members of the medical profession who are concerned, either centrally or locally, with the supply of doctors to meet a war emergency is to be held by the British Medical Association on February 15. The conference will be addressed by the Minister of Health, who will outline his plans for utilizing medical personnel should the need arise. The decision to hold such a conference was taken at last week's meeting of the Council of the British Medical Association, the consent of the Minister to the proposed arrangements having been already received. The conference will be attended by members of the Association's Central Emergency Committee and also of local emergency committees. The Central Emergency Committee is the body responsible for the B.M.A.'s war emergency register, which was undertaken more than a year ago at the request of the Committee for Imperial Defence. The register contains some 45,000 names and gives such details as age, medical qualifications and experience, and also availability and readiness for different forms of war service. Local emergency committees will advise, in consultation with central and local authorities, on the allocation of medical personnel for local needs.

NEW LEAGUE HEALTH JOURNAL

The Health Organization of the League of Nations has begun the issue of a small twice-monthly journal—no more than an eight-page sheet at present—entitled the *Chronicle*, and intended to keep the members of its various commissions, its collaborators, and those engaged in public health departments and scientific institutes in various countries informed of the Organization's activities. It is not, of course, meant to replace the *Bulletin*, a much more ambitious publication issued six times a year and containing the various technical reports, but it will be a useful summary and diary of events. In the Health Organization some work apart from routine is continually proceeding. For example, this first issue of the *Chronicle*, dated January 1, mentions no fewer than ten meetings of commissions, conferences, or consultations of experts which took place, mostly in Geneva, during the last three months of 1938. The number also contains an article on the expanding work on biological standardization carried out under the auspices of the Permanent Commission set up in 1921. The annual subscription for this leaflet is 5s., post free, and the price of a single copy 6d.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* are now ready. They will, however, not be issued with all copies of the *Journal*, but only to those readers who ask for them. Owing to the nature of its contents the *Key to Current Medical Literature* is not indexed. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Finance Department, British Medical Association House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

The centenary of the *Medical Press and Circular* has now been made a matter of permanent history in a beautifully illustrated and printed form. It started life as the *Dublin Medical Press*, the only medical journal in Ireland and with only two such contemporaries—the *Lancet* and the *London Medical Gazette*—in England. In 1866 it was united to the *Medical Circular* of London to become the *Dublin Medical Press and Circular*. As it was edited for sixty-two years by the Dublin surgeons Arthur and Archibald Hamilton Jacob, father and son, it is not only most fortunate but highly appropriate that Professor R. J. Rowlette of Trinity College should write this attractive memorial. The successive editors are pleasantly described, and many readers will look on the portrait of Harry Campbell with affectionate memories.

The Minister of Labour has appointed an Advisory Council, with Sir Walter Moberly as chairman, to advise him on the utilization in war-time in Government Departments or elsewhere of persons with scientific, technical, professional, and the higher administrative qualifications. Among those who have accepted membership are Mr. H. L. Eason, F.R.C.S., Principal of the University of London; Sir Edward Mellanby, F.R.S., Secretary of the Medical Research Council; and Professor A. V. Hill, F.R.S.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

CHRONIC RETENTION OF URINE

BY

R. OGIER WARD, M.Ch., F.R.C.S.

Chronic retention may be complete or incomplete. Both are serious conditions, and treatment of them is of great importance and often vital. Retention which is incomplete is particularly liable to escape notice.

Illustrative Cases

A man aged 64 was in the habit of passing urine twice by day and once by night, and he was satisfied that the stream was good. He had felt sick and ill for a fortnight, but found it difficult to reconcile his failing health with the fact that he had recently gained 5 lb. in weight. On examination the bladder was found to be much distended, the fundus reaching to the costal margin. After partial catheter drainage had been established a residuum of 74 ounces was on one occasion withdrawn. The gain in weight was thus explained, since a pint of water weighs a pound and a quarter. A small but highly obstructive prostate was subsequently treated successfully by perurethral resection.

Such infrequent micturition is, however, uncommon when partial retention exists. More often the patient asserts that urination is too free, and that there is occasional incontinence of urine by day. More rarely, severe nocturnal incontinence occurs, a symptom which may cause the obstructive factor to be overlooked and therefore untreated.

A man aged 64 complained of nocturnal enuresis for three months. This occurred almost every night, and large amounts of urine were passed during sleep. His health had deteriorated so much that he had resigned from an important position in business. On bimanual examination the bladder was found to be much distended and there were 28 ounces of residual urine. He was treated by prostatectomy. Six months later he was in better health than for many years, and bitterly regretted that he had retired upon a pension.

Treatment

The treatment of patients suffering from chronic retention of urine is always a matter of anxiety. The bladder must be emptied, but with caution, since if this is done too precipitately uraemia may be induced, or if present it will be increased, for it is to be remembered that the kidneys of many patients suffering from chronic retention are already seriously damaged as a result of long-standing back pressure. The patient should therefore be carefully examined from this point of view. The history may reveal a loss of appetite, nausea, and thirst, and the tongue is often dry. A blood-urea estimation provides the most important evidence.

Drainage may be by the passage of a catheter two or three times in the twenty-four hours, half to three-quarters of a pint being withdrawn on each occasion, thus gradually emptying the bladder. But although this is one of the safest methods of treatment it is an experience which is unpleasing to the patient and imposes considerable demands upon the doctor in attendance, particularly as in a good many instances instrumentation tends to become more difficult. For these reasons a tied-in catheter with spigot will often be employed, the urine being drawn off at the rate already indicated until the bladder is emptied. The plug can then be removed and the catheter allowed to drain continuously. These methods will usually avoid too rapid decompression, which may lead to uraemia or, less commonly, to haematuria. The following, however, describes a case in which they failed:

A man aged 77 had suffered from increased frequency of micturition for two years, and recently from nausea with occasional vomiting and loss of appetite. The prostate was considerably enlarged and the bladder distended to the umbilicus. A size 18 (Charrière) catheter was tied in the urethra with the intention of beginning gradual decompression, but as soon as the catheter was plugged the bladder emptied itself, the urine escaping round the instrument. When the bladder was washed out preparatory to refilling it considerable haematuria occurred, continuing for twenty-four hours; cystotomy was then performed. Two days later the blood urea, which had been 166 mg., had fallen slightly, but the count of red cells was now only 3½ millions and the haemoglobin 60 per cent. Haematuria continued for ten days, and was considered to be from vessels on the large intravesical projection of the prostate which had been recognized at cystotomy. It was arranged, therefore, to give a blood transfusion and perform prostatectomy. The patient, however, died under the anaesthetic.

At the necropsy the pelvis of the right kidney was found full of blood, which had leaked from a small tear in its substance into a calix, and there was also haemorrhage into the perinephric fat. The right ureter was dilated to the size of an index finger, and was full of blood. The left kidney contained much pus, and its ureter was dilated. There had been no bleeding from the bladder or prostate.

Such a case illustrates many of the dangers which have to be faced in treating chronic retention. The combination of old age, advanced structural damage, and infection makes such patients very poor surgical risks.

Cystotomy is often necessary, either as a step towards prostatectomy or as a means of permanent bladder drainage when further surgical treatment is prohibited by the patient's enfeebled state. However neatly and expeditiously the operation is performed, and however skilful the anaesthesia, there is always a high mortality, the average being about 15 per cent. Hiccup, nausea, vomiting, and diarrhoea are common, and are manifestations of the uraemia which so often leads to the patient's death. Local anaesthesia may be employed, but it does little to prevent the chest complications which frequently make their appearance.

In every case of chronic retention of urine there is a great need to establish and to maintain diuresis, since damaged kidneys are often incapable of forming a concentrated urine, and waste products can therefore only be excreted if the volume of it is abundant. Copious drinks must be taken—orangeade containing 5 per cent. glucose, water, tea, or fluids in any form which the patient fancies—in spite of the fact that this imposes a considerable strain upon the cardiovascular system. A continuous rectal drip of 5 per cent. glucose and one-fifth normal saline is of great value, particularly if flatulent distension makes drinking difficult; or ordinary water may be used with excellent effect.

Fluids given by continuous intravenous drip are of the greatest value in critical cases, the best form being a solution of one volume of normal saline to four volumes of 5 per cent. dextrose in distilled water (Avery Jones and

Naunton Morgan, *St. Bart's Hosp. Rep.*, 1938, **71,** p. 109). Every endeavour should be made to get the patient to take, by one means or another, a total of five to eight pints of fluid per twenty-four hours. If this can be achieved the outlook is favourable; if not, whatever may have been done to provide drainage for the bladder will often be in vain.

Acute Retention of Urine in the Female

This condition is most commonly due to an impacted fibroid or a retroverted gravid uterus, the latter usually occurring in the third month of pregnancy. The immediate treatment in either case is catheterization on one or more occasions, and as soon as the cause has been diagnosed this should receive appropriate treatment. Acute retention also occasionally complicates carcinoma of the cervix when the neck of the bladder has been involved. Catheterization with dilatation usually provides temporary relief.

Stricture of the urethra is a somewhat uncommon disease in the female, but is occasionally met with, giving rise to difficulty in micturition, which may lead to retention. It is treated by dilatation.

Retention of Urine in Children

This is liable to occur in male infants, being due to a pin-hole urinary meatus, and particularly when this becomes ulcerated. The act of micturition is very painful, and this causes the child to shrink from it, so that the bladder is not uncommonly found to be distended. The treatment is meatotomy with suture of the sides of the orifice to the remains of the prepuce, for the child will almost always have been circumcised in some earlier endeavour to produce a cure. If, after removal of the sutures, this is followed by dilatation of the meatus for a fortnight a cure will always be obtained. Other causes are congenital strictures of the urethra, or congenital valves in the posterior urethra. In these conditions there is usually chronic retention and uraemia, the bladder being greatly distended and the kidney function often damaged. Treatment is difficult and often dangerous, and includes dilatation of the stricture or destruction of the valves, cystotomy often being necessary. Phimosis is not a common cause of retention of urine, but should it occur the diagnosis is obvious and the treatment simple.

Non-mechanical Retention of Urine

Non-mechanical retention is seen in its commonest form following operations for piles or fissure, but may arise after any abdominal operation. In an endeavour to prevent it the patient should be encouraged to pass urine before six hours have elapsed. If unsuccessful and there is no discomfort a further period of six hours may be allowed before a catheter is passed. In the interval certain measures sometimes meet with success. One of these is to give an enema; another is for the patient to drink a tumblerful of cold water in which a small teaspoonful of boric acid has been dissolved. If his condition justifies it the use of a commode may enable the bladder to be emptied. In the female a hot compress may be applied just above the pubes and warm water may be gently poured from a jug over the vulva, the patient being on a bed-pan. Sneezing sometimes initiates micturition, and snuff is proffered with this object. A more modern method is the subcutaneous injection of 1 c.cm. of doryl, which is considered to have a specific action upon the bladder musculature; the dose may be repeated in half to one hour. Frequently, however, a catheter is necessary: it should always be passed with strict asepsis. Once may be sufficient, but in spite of all stimulants to spontaneous micturition retention may persist for several days, making catheterization necessary four or more times in every twenty-four hours. If so hexamine should be given and the bladder washed out with a tepid solution of oxycyanide of mercury 1 in 6,000 in an endeavour to prevent the infection which is otherwise so likely to occur. In hysterical retention any of the above measures may be tried, and doryl may be found effective; the use of the catheter should be avoided if possible.

Chronic retention of urine sometimes occurs in tabes and disseminated sclerosis: the onset is insidious, and the volume of residual urine is often large without uraemia being present. Cystotomy should be avoided where possible, and is strongly contraindicated in the latter disease. Intermittent catheterization is the best treatment if any is required, and may lead to a considerable recovery in bladder function.

MANCHESTER'S HOSPITAL SERVICES

VISIT BY THE MINISTER OF HEALTH

The Minister of Health, Dr. Walter Elliot, visited Manchester on Friday, January 20. He formally opened a new orthopaedic block at the Manchester Royal Infirmary and a new extension at St. Mary's Hospital for Women and Children. A less formal visit was paid to the Christie Hospital and Holt Radium Institute, and finally Dr. Elliot addressed a meeting at the Town Hall and discussed the problems which might face the city's medical services in the event of war.

New Orthopaedic Block

The new orthopaedic block at the Infirmary is the first concrete, or rather ferro-concrete, result of the co-ordination of the city's hospital services which has been taking place under the aegis of the Manchester Joint Hospitals Advisory Board during the last three years. Dr. Elliot, after a brief review of the pioneer history of the Infirmary, expressed his pleasure in giving public recognition to one of the schemes of co-ordination fostered by the Joint Hospitals Advisory Board. The Board, to which he referred with appreciation as the first of its kind in the country, merited the most sincere congratulation on the remarkable work which it had initiated and in some respects already completed. The work done in unifying the efforts and resources of the voluntary and municipal hospitals was of great importance, and he was especially pleased by the fact that among other members of the Board were representatives of the medical school of the University, so that medical education in the city also comes within its sphere of influence. The new orthopaedic block itself, he said, represented the work of an almost ideal combination that should serve as a model for the country and as a focus of regional hospital service such as was envisaged in the official recommendations of a recent committee (Lord Cave's). The new department was fully equipped to provide for all stages of fracture treatment from first aid to rehabilitation, and was a valuable contribution towards national life in that it would ensure the return of the injured person to full economic vigour at the earliest possible date. After a vote of thanks, proposed by Professor J. S. B. Stopford, vice-chancellor of the University, and seconded by Mr. Harry Platt, the Minister inspected and formally opened the new building.

Extensions at St. Mary's

At St. Mary's Hospital for Women and Children further expression of the principle of co-ordination was given by the new extension, which Mr. Elliot opened later in the morning. This extension contains a new out-patient department for children, another for gynaecological patients, and fifty new in-patient beds and fifty bedrooms for nurses. The new out-patient accommodation is spacious and comfortable, with a canteen, a record room, offices for clerks, almoner, and registrar, and every possible privacy for patients in separate dressing cubicles. It will have as patients some 5,000 women and as many children annually. The number of examination cubicles has been increased from two to six, and the arrangement is such that teaching facilities are greatly improved. Dr. Elliot referred to these advantages in his speech, and laid stress also on what he described as a great step forward—medical co-operation between two great teaching hospitals, the Manchester Royal Infirmary and St. Mary's Hospital, to form a large university teaching centre. In the future no gynaecological patients would be treated at the Infirmary. All such patients would be transferred to St. Mary's, while in return all the ancillary services of the Infirmary—*x*-ray, physiotherapy, dietetics, etc.—would be available to St. Mary's patients. There would also be co-ordination between the medical and nursing staffs. This was not amalgamation of two hospitals. It was co-operation in accordance with the recommendations made by Lord Sankey's recent Voluntary Hospitals Commission, though the first steps in this case had been taken long before that report was published. A vote of thanks was proposed by Mr. Francis Grundy, chairman of the Board of Management, and was seconded by Professor W. Fletcher Shaw.

Improved Orthopaedic Facilities

The new block at the Royal Infirmary houses the orthopaedic department and the department of physiotherapy. The ground floor consists of a modern and fully equipped fracture clinic, with waiting-rooms, examination cubicles, a large plaster room, a small out-patient theatre, records offices, and rooms for the staff. Every year some 2,800 patients with fractures or dislocations will pass through this clinic, as well as an equal number with serious injuries of soft tissues, including nerve trunks and tendons. Comfortable chairs are provided for waiting, the patients will dress and undress in private, and they will be examined one at a time in individual cubicles. With the advantage of more spacious accommodation it has been possible to "stagger" their attendances to prevent undue waiting. Thus some patients are instructed to arrive at 9 a.m., some at 10 a.m., others at 11.30 a.m., and so on. The physiotherapy department and its school, which occupy the upper floors, are similarly planned to give patients privacy and comfort as well as every modern remedial treatment.

This important orthopaedic department with its fracture clinic serves not only the City of Manchester but also, as a part of one of the largest teaching hospitals in the provinces, takes its patients from all parts of the north-west of England. The new building, which has been wanted for a long time, has had to be erected almost as a matter of urgency in view of the rapid increase in the number of fractures treated in the Royal Infirmary since 1934, when these cases were segregated into a special clinic under the control of Mr. Harry Platt. It was also urgently necessary to move the department of physiotherapy from the cellars in which it had perforce been housed and to place it in better surroundings and in the closest contact with the orthopaedic service. The plans for the new building, as well as the organization of the services it houses, were approved by the Interdepartmental Committee of the Ministry of Health and the Home Office on the Rehabilitation of Persons Injured by Accidents when that committee visited the Infirmary in 1936, and the whole matter has also been exhaustively considered by the Manchester Joint Hospitals Advisory Board. These deliberations followed the British Medical Association's report on fractures in 1935, the recommendations of which report are embodied in the building and in the service.

It is hoped that in the future this service will form an important part of a much wider scheme for the treatment of fractures which has been evolved by the Joint Hospitals Advisory Board. This scheme will involve the co-ordinated grouping of the existing fracture services into northern, central, and southern areas, and will provide for the free interchange of fracture cases between these areas and between the voluntary and municipal hospitals. Such an arrangement may make it possible in the future to concentrate all the cases of one particular fracture, say of the neck of the femur, into one unit under the care of one surgical team, for intensive study, treatment, and investigation and for follow-up studies over long periods. A special subcommittee of the Board was satisfied that the new block at the Royal Infirmary will serve efficiently the central division of the city and will also be adequate to fulfil the hospital's special responsibilities with regard to teaching and research.

A University Hospitals Centre

The High Street branch of St. Mary's Hospital, with its new extension, lies next door to the Royal Infirmary. The new maternity branch is to be built between this new extension and the existing University pathological laboratories and the department of experimental surgery. The Royal Infirmary with its new orthopaedic block, St. Mary's Hospital with its new out-patient department, the Royal Eye Hospital, the University departments of pathology, bacteriology, and experimental surgery, the municipal public health laboratories, and the house of residence for senior medical students already form a compact group and could be enclosed within a single wall. They are, moreover, only a stone's throw from the University and the medical school proper, and they face Whitworth Park, one of the largest open spaces in Manchester. It only remains to provide a new ear hospital and to proceed with the building of the new maternity block which is proposed to give the City of Manchester an easily accessible hospitals and academic centre, which will be equal for position and size with any in the world.

Applications are invited for Leverhulme fellowships or grants in aid of research, intended for senior workers who are prevented from carrying out research by routine duties or pressure of other work. Any subject which may add to human knowledge may be proposed for a fellowship or grant, but preference is given to subjects in which other provision for research is inadequate. The amount granted will depend on the nature of the research and the circumstances of the applicant. Forms of application, returnable by March 1 at latest, may be had from Dr. L. Haden Guest, Union House, St. Martins-le-Grand, London, E.C.1.

Reports of Societies

POLIOMYELITIS AND ARTIFICIAL AIDS TO RESPIRATION

At the meeting of the Medical Society of London on January 23, with Dr. C. E. LAKIN in the chair, a discussion was held on poliomyelitis.

Sir HENRY GAUVAIN said, in opening, that although anterior poliomyelitis was an infectious disease, and was usually referred to isolation hospitals, its treatment from the onset should be undertaken by orthopaedic surgeons. Often precious weeks were lost when such treatment was unobtainable, and the ensuing disabilities could not subsequently be repaired. He went on to give details of cases at Treloar's which he had personally treated with the respirator, mainly the Drinker. During last year eighty-seven cases were admitted, sixty of them within a year of onset, and of this number thirty-five were acute cases, of which seven needed the respirator on admission. The high percentage of cases of respiratory failure was astonishing. Of the seven cases treated in the respirator four had died; the others recovered after periods of from fourteen to forty-seven days in the respirator. One of the patients who died was a woman aged 39, who incidentally, no doubt through Press publicity, had a great fear of getting infantile paralysis, and an even greater fear of the Drinker. Hers was a very unusual case, and at necropsy numerous small haemorrhages were found in the brain and other organs, the bladder was greatly distended, and there were necrosis and areas of haemorrhage in the kidneys.

Some points with regard to nursing of patients in the Drinker were of importance. The patient's head should be turned every four hours to prevent undue pressure on the back of the head and also to prevent the development of torticollis. When the patient was first taken out of the Drinker for short periods, the neck piece and motor should be kept going to give him confidence. The patient might dread being put into the Drinker, but he afterwards dreaded being taken out, and it was a reassurance to him to know that he could be replaced in a moment.

Lord Nuffield's Gift

"I do think we ought to be very grateful," said Sir Henry Gauvain, "to Lord Nuffield for his magnificent offer to give every hospital a respirator; but it is most desirable for any accepting hospital—and I hope there will be many—to have a team ready and available all the time to do the treatment properly, because a child put in a Drinker or a Both who has an inexpert person in charge of him is very likely to die. I can imagine a little country hospital accepting one of these respirators and not having the means of looking after it properly. It needs to be oiled, and the motor used every week at least, and the bellows kept intact. A great deal of trouble is necessary, but it is well worth it."

Sir Henry Gauvain then showed two reels of film which had been lent to him by Professor Macintosh and Dr. Pratt of the Nuffield Department of Anaesthetics at Oxford illustrating the principles involved in the use of apparatus for the artificial ventilation of the lungs. They included the working of the Drinker apparatus, the Both, the Bragg-Paul respirator, the Burstall respirator, in which the chest is rhythmically subjected to negative pressure, the "biomotor," a German invention for exercising pressure through the abdomen, certain simple methods depending on varying the posture of the patient, so that the weight of the abdominal contents, through the diaphragm, increased and decreased the capacity of the thorax (such devices as the rocker, the barrel, and the sling), and finally methods depending on the inflation of the lungs with oxygen under pressure. These last included the McKesson respirator, in which rhythmical deliveries of compressed oxygen are controlled by a piston which is actuated by the pressure of the oxygen in the cylinder, and the Oxford respirator, which delivers oxygen under easily adjustable pressure, controlled by a valve operated by hand.

Dr. C. P. SYMONDS, in discussing the diagnosis of poliomyelitis, said that he had a suspicion that some of the cases reported as having made such extremely complete recoveries were not poliomyelitis at all, but acute febrile polyneuritis. The diagnosis of poliomyelitis in the pre-paralytic stage was extremely difficult, except in the presence of an epidemic. The consultant in this country seldom had the opportunity for observation in the earliest stage, but it appeared that in many cases from the first the family doctor had noticed more in the way of mental disturbance, confusion, restlessness, and stupor than he would expect with an ordinary fever, and certainly by the time the illness had reached its second phase, the pains and stiffness of the neck and back, the mental state was often suggestive of encephalitis. The appearance of a paralysis in the limb was, of course, distinctive, but in a good many cases this was preceded by symptoms of brain-stem involvement. Excessive regurgitation and diplopia were not uncommon early symptoms, and nystagmus might be the earliest abnormal physical sign.

The Use of Serum

Dr. Symonds reviewed the work on the use of serum in the treatment and prevention of poliomyelitis, which had been much debated during the last twenty-five years. The scientific evidence was against the value of serum, and the use of serum had been abandoned by those who had studied it. During the past few months fresh claims for serum treatment had been made by certain orthopaedic surgeons in this country. These claims were supported by no new evidence, but their advocates had succeeded in making an impression on the general practitioner and on the public. This would not matter much if it were not for the implication that those who did not use serum were either ignorant or lazy. As an indirect consequence of the recent orthopaedic revival, some mothers were convinced that had serum been given their children would not have been paralysed. This was wholly unjustifiable. Moreover, he was by no means convinced that serum treatment was harmless. The intrathecal injection might provoke meningeal reaction with pain and fever. As to the value of convalescent serum as a prophylactic measure when the disease was epidemic, this had yet to be determined. There was no convincing evidence of its value, but the opportunity for investigation on a large scale was more likely to occur in the United States than in this country. Here there was little or no experience of poliomyelitis in its major epidemic form.

As a result of experience, or relative non-experience, of the disease, there was some tendency to regard it as not very infectious. It was true that the chances against any one individual being attacked in a boarding school with a population of 500 in which one or two cases had occurred were very high, yet many people must have met with examples which suggested contact infection. He related one case which seemed to have been communicated from one person to another by kissing, and another case of the infection of two persons by contact with a healthy carrier, who presumably had brought the infection across the Atlantic. At present there was no sure or harmless means of detecting the healthy carrier. MacNalty made two recommendations of great importance. One was that a patient with poliomyelitis should be isolated from other children for six weeks and personal association with him limited to the minimum necessary for proper care and nursing. To this Dr. Symonds would add the advice that the nurses should be over 25; age was by far the greatest factor in natural immunity. The second recommendation was that children in the infected household should remain

away from school for three weeks after isolation of the patient. His own suggestion was that indoor contact with anyone under the age of 21 should be avoided, kissing should be prohibited, and for those in quarantine paper handkerchiefs should be used and placed after use in a paper bag or other receptacle, which should be burnt without its contents being removed. As to the policy to be adopted in the case of a residential school, on the occurrence of the first case all parents should be notified, and those who wished and were able to do so should remove their children by motor car and adopt at home the precautions already mentioned, under the supervision of the family doctor.

Mr. WHITCHURCH HOWELL said that his first experience of epidemic poliomyelitis was the Essex outbreak in 1926, when he saw from 100 to 150 cases. The Essex outbreak of 1938 was remarkable for the number of deaths from respiratory paralysis, and he gathered that this also applied to the cases in Hampshire. The cases in Essex recently had been much more virulent than on the occasion twelve years ago, and the permanent paralysis up to the present seemed to be much more severe. With regard to the apparatus, he had seen the Drinker in use, but in the case of a child of his own with anterior poliomyelitis he would endeavour, provided the patient was conscious, to put him into a Bragg-Paul, which was most comfortable, and from the orthopaedic surgeon's point of view gave facility for splinting all four limbs simultaneously. He believed that the period of prevalence of this disease was extending. In 1926 the epidemic was a short one, starting about the beginning of July and finishing before the end of October, but now there appeared to be an increase of cases towards the early part of the summer and again towards the winter.

Sir HENRY GAUVAIN, in reply, said that if children were frightened of the Drinker they were readily reassured, and he did not think the fear of the apparatus was a point of any real importance. With the Bragg-Paul it was true the orthopaedic surgeon had the advantage in respect of splinting, but in the new Drinker it was quite easy to abduct the arms and use light metal splints, which he preferred to plaster in the acute stages of poliomyelitis. His nurses as a routine wore masks and gowns, though when one considered that the virus would go through the finest Berkefeld filter he did not think a mask could make much difference. Dr. SYMONDS differed from Sir Henry Gauvain in regard to masks. The fact that a virus would go through a filter did not mean that a droplet would go through a mask.

PHYSIOLOGICAL ASPECTS OF RHEUMATISM

In the Section of Physical Medicine of the Royal Society of Medicine on January 20, with Dr. COLLIS HALLOWES in the chair, an address was given by Professor SAMSON WRIGHT on the physiological aspects of rheumatism.

Mechanism of Pain

Professor Wright began by discussing the mechanism of sensation. The intensity of any sensation seemed to be associated with the frequency of impulses in the sensory nerves. If of low frequency the intensity was low ; if high, say 50 to 100 per second, the intensity of the sensation was correspondingly high. The extent of the sensation depended on the number of nerve-endings and of nerve fibres put into action at any moment, and therefore on the area of the cerebral cortex which was activated. The anatomical relationship was more complicated, but the most difficult problem of all was to account for the quality of sensation. Anatomical connexions, frequency of impulses, or number of fibres in action did not help in the understanding of the quality of sensation ; it depended on some mysterious unanalysable characteristic in some region of the brain. The area of the brain responsible for the conscious sensation of pain was still in dispute. Pain was a sensation in itself, not merely an intensification of other sensations. Sir Thomas Lewis had suggested that a complete description of pain should comprise a statement of its severity, its kind or quality, and its relation to time, locality, and circumstances, and that the severity of the sensation was the part of the problem to which least attention need be devoted. The duration and the time intensity might be of great diagnostic value, and so might the localization, though the localization of pain was difficult, particularly if a considerable time elapsed between the appreciation of the pain and the examination, or if the pain involved deeper visceral or somatic structures.

There were three kinds of somatic pain—respectively from the skin, the muscles, and the tendons—differing qualitatively in their characteristics. Skin pain had always essentially the same quality however produced. If the stimulus was a brief one the patient felt it as a pricking pain ; if more prolonged, as a burning pain. The muscles, too, had a pain sensation of their own which was characteristic, being disagreeable, continuous, perhaps fluctuating in intensity, and difficult to locate, but the patient could usually distinguish it quite clearly from skin pain. A point of importance with reference to muscle pain was that the pain might not only be felt locally in the muscle affected, but might be referred to distant parts. The third pain was felt in the tendons and fascia and periosteum. It was sometimes called " web pain " because pain of an analogous nature could be produced by pinching the web between the fingers. Perhaps the most interesting form of deep pain was the pain produced in muscle by ischaemia. It could be brought about by obstructing the circulation to a limb and exercising the limb. After a short period pain set in and became increasingly severe and ultimately quite intolerable. Though the pain was diffuse it could still be felt most markedly in the muscles. It was not due to spasm of the blood vessels beyond the point of occlusion because actually the vessels beyond that point underwent dilatation, nor was it due to muscular tension. It was probably due to some chemical products, metabolites, which were formed, and, so long as the circulation was intact, were combusted or removed by the circulation, but under conditions of ischaemia accumulated, and produced the pain when a certain concentration was reached.

Rational Basis of Massage

After some remarks on the regulation of the blood supply to the skin and muscles under various conditions, the interchange of fluids between blood and tissues, the flow of lymph, and recent work on muscle metabolism, Professor Wright turned to some considerations regarding massage treatment. He first pointed out that there was a good deal of rather obscure chemistry in connexion with muscle injury or activity, leading to the liberation of substances which might produce not only local effects but reflex effects and chemical effects at a distance. Superficial stroking was said to improve the cutaneous circulation, especially by promoting flow in the superficial veins and lymphatics. Some of these claims ought to be examined critically in the light of current physiological knowledge. A very light stimulation acted directly on the capillaries of the skin, resulting in a contraction of the capillary wall. If the stroking was more vigorous it would produce varying degrees of vasodilatation, depending on the strength of the stimulation employed and the susceptibility of the subject. These reactions resulting from stronger stroking might be due to the liberation of the histamine-like substance in the skin or some unstable precursor. The capillary dilatation was due to a direct action of this substance on the capillaries. It was probably inaccurate to stress excessively the effects of stroking of this kind on the flow in the lymphatics, because, judging from experiments on normal animals, the rate of flow in the lymphatic was very slow compared with that in the veins. It was very improbable that a

mechanical effect on the lymphatics could contribute very much to facilitate tissue fluid interchanges. On coming to reflex effects he must be more cautious. Adequate and properly controlled clinical investigations seemed to be scanty. But altogether he felt that the claims for superficial stroking could not be accounted for by known physiological considerations.

Deep stroking would produce greater mechanical effects and possibly influence the underlying viscera. The minute tissue damage from deep stroking might liberate histamine and other metabolites in sufficient amounts to enter the blood stream and produce effects at a distance. Sweeping claims were made for compression and percussion movements, which were said to influence muscular activity, to remove fatigue and other waste products, and to improve the local vascular and lymphatic circulation. Stress was also laid on indefinable factors such as a sense of well-being in the muscles. It was necessary to clear the ground by disposing of claims which had been disproved. The degree of muscular activity induced by massage, local or general, was too small to be measured. There were no significant changes in the blood. Some local effects were produced in the muscle. The massage of resting muscles in animals had been shown to produce a definite increase in blood flow, but small compared with the increase during activity. In this connexion he drew attention again to the problem of the liberation of metabolites when the muscles were vigorously stimulated. Particular attention should be paid to the reflex effects, alike on the muscles stimulated, muscles elsewhere, and other organs.

Reactive Hyperaemia and Artificial Hyperpyrexia

A procedure perhaps not very widely employed was that of reactive hyperaemia. The circulation to a limb was obstructed for a few minutes by means of a tourniquet, then the obstruction was released, and it was found that the skin flushed brightly and the pulse volume in the limb increased. The mechanism could probably be accounted for by metabolites liberated during the period of ischaemia.

The last procedure to which he referred was artificial hyperpyrexia, which from published accounts seemed to bring the patient near to the limit of tolerance. A word or two about insensible perspiration might not be out of place. Insensible perspiration was a process which depended on the physical diffusion of water from the blood vessels through the epidermis to the surface. The kind of perspiration which went on under resting conditions did not appear to be dependent on the sweat glands at all. When the body temperature tended to rise, heat loss was increased mainly by increased sweating and evaporation from the skin. Of the procedures recommended for artificial hyperpyrexia he need not discuss any but the electropyrexial technique. The physiological changes that took place in the body included a rise in the pulse rate, perhaps to 160 a minute; variable changes in the systolic blood pressure, which might rise, but often might fall seriously; a fall even to zero in the diastolic pressure, which must adversely affect the heart action; and serious alterations in the respiration, which might become irregular as the temperature rose. Long bouts of apnoea had been described, and generally a kind of Cheyne-Stokes breathing seemed to occur. Probably the most important changes were in the blood, due to water loss, which ought to be compensated by the administration not of water but of saline. The blood changes and the general changes in the body under conditions of extreme heat deserved more adequate study.

General Discussion

Dr. KERR RUSSELL said that at the National Temperance Hospital, where artificial hyperpyrexia had been employed during the last five years, the method was now used of employing nebulized hot water. Patients who had had experience of other methods said that the nebulized hot water was much more comfortable. The secret of it was that there was much less sweating. The patient was in a cabinet and the air was 100 per cent. humidified. With the earlier methods occasional tetany and muscle cramps were experienced.

Dr. C. W. BUCKLEY suggested that if practitioners of physical medicine went back and had a course of physiology their methods might be greatly improved. One peculiar muscle symptom on which perhaps the lecturer could throw some light was what the patients called "fidgets"—a sensation, chiefly in the calf muscles, generally when one was trying to drop off to sleep, possibly a minor degree of that form of muscle pain which occurred if a muscle was exercised when the circulation had been obstructed. As for massage, he was a profound disbeliever in that result of massage which was often stated to occur—namely, the rubbing away of fibrous nodules. He had never yet seen a piece of scar tissue which could be rubbed away, and he presumed the true fibrous nodule was akin to scar tissue. The only "nodules" which could be rubbed away were localized areas of muscle spasm.

Sir WILLIAM WILLCOX said that Professor Wright had given an excellent description of the various forms of massage, but, after all, the proper application of massage did a great deal of good, and the proof of the pudding was in the eating. He had always been of opinion that it was very important to consider the lymphatic circulation in chronic rheumatic affection. Perhaps the lymphatic circulation played a more important part than Professor Wright thought. As for hyperpyrexia, it was clear that although this treatment was of value in many conditions it was fraught with certain risks. Professor Wright had not mentioned the danger of convulsions, which sometimes occurred, also the danger of syncope through interference with the coronary circulation. Was it wise to practise hyperpyrexial treatment in an out-patient department without beds? Dr. GEOFFREY HOLMES referred to the relative lack of value of the textbooks of physiology to the practitioner of physical medicine, and the PRESIDENT asked for further elucidation of the problem of muscular stiffness.

Professor WRIGHT, in reply, said that he had not intended to cast aspersion on the results of treatment, but he thought it always a mistake to offer some facile explanation of the results of treatment on pseudo-scientific lines; it was far better to regard the treatment as empirical. He felt strongly the unhappy position of the massage student who was being taught a mass of pseudo-scientific facts which very few people would be prepared to swear to. It would be better to teach him as a craftsman merely to carry out certain manipulations, knowing that those manipulations, without any particular reason, would lead to certain results. Sir William Willcox's remarks about the dangers of hyperpyrexia were very much to the point; at the same time he had no doubt, judging from the literature at any rate, that people of experience handled patients on the threshold between existence and non-existence with considerable skill, though sometimes, it would appear, the borderline was passed. He agreed as to the unsatisfactory character of physiology textbooks; he said so candidly, being himself one of the authors incriminated. It was difficult in writing a textbook on physiology to write on topics of interest to all branches of the profession. Perhaps it would be better if in books on physiotherapy the physiology was more adequately considered. On the President's question, they had to confess ignorance regarding all the fundamental events occurring in muscle, and stiffness was one of them. The dispersal of stiffness was best regarded at present as an empirical procedure.

GOLD THERAPY

At a meeting of the Manchester Medical Society on December 7, 1938, Dr. A. R. SOMERFORD opened a discussion on gold therapy.

Dr. Somerford said that although some authorities might claim that they used gold salts in treatment without producing any untoward reactions this was not the experience of most observers; some had noted them in as many as 45 per cent. of their cases, though many of these reactions were mild. Reactions might appear at three stages: immediate reactions occurring within a few

hours of the injection and including the so-called *grippe aurique*; reactions during the course of treatment, including urticarial, morbilliform, and scarlatiniform eruptions; and reactions arising after the cessation of treatment, possibly several weeks later, when in addition to cutaneous reactions, blood, hepatic, and renal changes were common. The theories of causation included hypersensitivity of the patient to gold, biotropism, the toxic effects of products resulting from the action of gold on the tissues, and faulty elimination by the kidneys due either to pre-existing deficiency or to renal damage produced by the gold. Whatever the cause, it was wisest to regard all reactions, even the mildest, as signs of gold intolerance and to terminate treatment. In considering the prevention of these reactions the type of gold salt used or the method of its administration seemed of little importance; calcium gluconate, glucose, and whole liver extract had been given simultaneously with the gold therapy and had been found to reduce the incidence of toxic symptoms. Repeated examination of the urine for signs of renal damage was most important. It had been suggested that the gold acted as a catalyst and that equally good results might be obtained with small as with larger doses. The results in the treatment of various conditions were encouraging, but it had to be remembered that serious symptoms and even death might result from injudicious dosage or lack of attention to mild symptoms of possible toxic origin.

Toxic Effects

Dr. NORMAN KLETZ reviewed briefly the history of gold as a therapeutic agent and referred to its introduction in the treatment of pulmonary tuberculosis. While our knowledge of the pharmacological action of gold was limited many of its effects were well known. They might be grouped as (*a*) specific gold reactions, such as general malaise, pyrexia, and local responses in the brain; (*b*) local damage at the site of injection—for example, abscess; and (*c*) toxic effects on the digestive tract (anorexia, nausea, vomiting, diarrhoea, stomatitis), the skin (variable, localized, or general), kidneys (albuminuria, sometimes nephritis), blood (toxic action on the bone-marrow producing aplastic anaemia, agranulocytosis, or thrombocytopenic purpura), liver (toxic hepatitis with jaundice), and on the nervous system (peripheral neuritis, mental symptoms, epileptiform attacks).

The importance and non-assessability of idiosyncrasy in relation to the toxic effects were considered. The type of preparation and pathway of injection were probably of little importance. Small dosage, short courses, and a long interval between courses minimized the dangers. Some users recommended the administration of 10 per cent. calcium gluconate at the time of injection, others liver extract by mouth or parenterally. When once toxic effects had developed it was doubtful if any effective treatment could be undertaken; treatment could only be symptomatic. Gold therapy was likely to be effective in cases of primary or secondary rheumatoid arthritis but was ineffective in fibrositis and also in osteo-arthritic cases, except in so far as in the latter group there might be a superimposed infective factor. In a review of 103 cases the actual evidence of individual toxic reactions was very small, and on the whole they were not severe. There was one fatal case due to thrombopenia and spontaneous haemorrhage, and one case of severe hepatitis which recovered. Assessment of results was difficult. In a considerable number of cases the improvement was dramatic, and in very few selected cases had there been failure to attain material improvement.

A lively discussion followed in which emphasis was laid upon the importance of care in dosage, careful observation for signs of gold intolerance, control of the treatment—preferably in hospital with regular blood investigations—and the need for a full consideration of each patient before beginning gold therapy.

A MICROSCOPIST LOOKS FORWARD

The Royal Microscopical Society, which celebrates its centenary this year, has re-elected as its president Mr. J. E. BARNARD, F.R.S., whose work on the ultra-microscopy of viruses is well known, and at a meeting of the society on January 18 Mr. Barnard delivered his fifth presidential address. His subject was the virus problem from the point of view of the microscopist.

The dividing line between the animate and the inanimate, he said, was undoubtedly becoming thinner, and the nature of the smallest protoplasmic unit which could behave as a living thing was still undetermined. Indeed life itself was undefined, and Mr. Barnard quoted a definition from *Punch* which he said was as good as any: "What we call life is something that begins somewhere and goes on until it finishes." But there was still so much in Nature to which the term "living thing" could unhesitatingly be applied that even a microscopical society might look forward to the future without anxiety. The smaller organisms called viruses showed similar characteristics and behaviour to their larger relatives the bacteria, and apart from the physical difference of size there was every evidence that the viruses, down to the smallest known in pathology, were in alignment with the larger organisms. But, of course, the smaller the size the greater the difficulty of the microscopist. The outstanding characteristic of the virus was its density; its opacity to ultra-violet radiation increased as its size diminished. One of the difficulties encountered in using ultra-violet radiation was in focusing the image, but this had been neatly overcome by the expedient of depositing on the cover-glass fine droplets of mercury, which were almost of exactly the same size as the organisms, and as these, unlike the organisms, showed up very well on the screen, by focusing the droplets it was possible to get the organism also into focus. Difficulty had also been experienced in getting a sufficiently thin section to enable a photograph to be taken through it, but recently a technique had been evolved whereby the tissue was embedded in paraffin, the section cut and laid on the quartz slide, the paraffin dissolved by xylol, the xylol replaced by alcohol, and the preparation finally mounted in castor oil, the only oil, so far as he was aware, which was sufficiently transparent in the ultra-violet to enable a photograph to be taken through it. Mr. Barnard reminded his fellow members that the band in the electromagnetic wave range which photomicrography had succeeded in using was from 4,000 to 2,000 Angstrom units, the visible spectrum being represented by the band from 7,000 to 4,000 units. The next step would be to make use of that portion of the range from 2,000 to 500 units, which would bring enormous advantages. It would, of course, carry the greater likelihood of damage to the living thing, but, as against this, exposures in the ultra-violet had been very greatly reduced, being now much shorter than many people would regard as necessary for ordinary light photography.

Mr. Barnard showed a large series of photomicrographs, beginning with the large organisms like the staphylococci, and then coming to the borderline organism of bovine pleuropneumonia and to the virus of vaccinia, the virus of the herpes found in the cornea of the rabbit, the virus of distemper in dogs, the pyogenic virus, and a virus which was found associated with a papilloma, a localized infection, in the domestic rabbit, the wart developing into a malignant tumour. His own interest in this work was first stimulated by the cases of trench fever during the war, when nearly 200 volunteers came along prepared to be inoculated with trench fever and to have their blood examined at stated intervals in the hope of discovering the suspected virus. The work on viruses had by no means reached its end. There was reason to hope, said Mr. Barnard, that very shortly it would be possible to do still better work in this field with new quartz objectives—made in England—when viruses beyond

present resolving powers might be identified. The outlook was distinctly encouraging. So far from microscopy going downhill, there was never a time when the prospects were so bright or the work ahead so promising. The introduction of ultra-violet microscopy had more than doubled the scope of the microscope, and if it went on to its further development, as it well might, so great a field would open up that the Royal Microscopical Society would need at least another century to do the work awaiting it.

Local News

SCOTLAND

Orthopaedics in Scotland

In an address at the annual meeting of subscribers to Stirling Royal Infirmary Dr. J. M. Mackintosh, Chief Medical Officer of the Department of Health for Scotland, stated that orthopaedics should not be regarded as a branch of surgery but as part of the science of preventive medicine, for orthopaedics meant not only surgery but the prevention of crippling and the after-care and rehabilitation of crippled persons. The surgeon might hold an essential controlling part as the director of policy, but his work was of little effect without a staff of teachers and voluntary workers. As an orthopaedic scheme developed orthopaedic surgery assumed less and less importance. In the scheme of one local authority in England it had been found that as ascertainment and prevention became more comprehensive the need for hospital treatment and operative intervention steadily diminished, and this was represented financially by a reduction in cost of from £9,000 yearly to £5,000 in the course of ten years. The first essential of any scheme was a hospital in country surroundings, and the annual cost should not be more than about £180 per bed. Clinics should be distributed through towns and larger villages in the area served by the central hospital, and these should work in close collaboration with the local authorities. Since the average stay for a tuberculous patient was about 500 days, it was necessary that the orthopaedic hospital should make provision for both education and recreation. The most obvious fact about organization for orthopaedics in Scotland was that it should be on a regional basis. A tentative division for this purpose suggested the four principal cities as the primary centres, but to provide an accessible service it would be desirable to create certain other regions, and there might, for example, be a region in Central Scotland including Stirling, Falkirk, and Alloa, and another for the county of Lanark. A further development might also be contemplated at Dumfries and a subregion at Inverness. Any scheme must be linked with the hospital activities of the area, and above all with the public health services of the local authorities.

Award of Swiney Prize

The Swiney Prize for 1939 for the best published work on jurisprudence has been awarded to John Glaister, M.D., Regius Professor of Forensic Medicine in the University of Glasgow, and J. C. Brash, M.D., F.R.C.S., Professor of Anatomy in the University of Edinburgh, for their joint work on *Medico-Legal Aspects of the Ruxton Case*. The prize was founded through a bequest made to the Royal Society of Arts by Dr. George Swiney, who died on January 21, 1844, and under the terms of the will it is awarded on every fifth anniversary of the testator's death. It consists of a cup of a value of £100 and money to the same amount. The prize is offered alternately for medical and general jurisprudence, and the award is made by a joint committee of the Royal Society of Arts and the Royal College of Physicians of London. The present award, being for medical jurisprudence, was made on the recommendation of a committee consisting of the President and Censors of the Royal College of Physicians. The book thus honoured reveals the brilliant work done by the joint authors in reconstructing the mutilated and dismembered bodies of the two victims of Dr. Ruxton in 1935.

Problem of Malnutrition

Dr. W. O. Kermack of the Research Laboratory of the Royal College of Physicians, Edinburgh, in a paper on biochemistry, diet, and national health, read before the Royal Scottish Society of Arts on January 10, said the science of biochemistry had made very important contributions to our knowledge of nutrition. Among these might be mentioned the discovery that certain substances exercised a beneficial effect in traces which were almost negligibly small; this held for such substances as iron, manganese, iodine, copper, and cobalt. It had been discovered recently that a wasting disease among sheep and cattle in New Zealand and Australia was due to a deficiency of cobalt, and that the animals were cured by quantities of cobalt so small that a pound a day sufficed for millions of animals. More recently certain Edinburgh workers had shown that the pine disease of Cheviot sheep was also cured by the administration of this metal. The major deficiency diseases—rickets, scurvy, beriberi, and pellagra—were prevented by adequate amounts of the appropriate vitamin. Although these diseases were seldom encountered in Britain to-day, there was considerable evidence that ill-health arose from a minor chronic deficiency of the protective foodstuffs. Among the poorer classes of the community the average intake of vitamin B was below the desired level; this could be largely remedied, said Dr. Kermack, if whole-meal bread were eaten more generally in place of white bread. The problem of malnutrition was a real one even in the more advanced countries such as the United States and Great Britain, but was still more acute in the poorer countries of Europe and Asia. Malnutrition was due partly to ignorance and partly to poverty; any financial outlay on proper nutrition would bring about great savings in medical and social services.

Reconstruction of Edinburgh Dental School

It was announced at the annual dinner recently of the Edinburgh Dental Students Society that the reconstruction of the dental school will be started immediately. The front portion of the present building, which is comparatively new, is to be retained, while the old part of the hospital will be pulled down. The University has promised temporary accommodation for lectures during the reconstruction period. The cost will be at least £50,000, of which £17,000 has already been collected.

ENGLAND AND WALES

Progress of Medical Psychology

In an address at a public luncheon arranged by the National Institute of Industrial Psychology at Princes Restaurant, Piccadilly, on January 19, Dr. J. R. Rees, medical director of the Tavistock Clinic, quoted Thomas Laycock, who as long ago as 1860 said that "a practical knowledge of mental science is essential to parents and masters, jurists and legislators, school masters and teachers, ministers, naval and military officers, governors of gaols and penitentiaries, and large employers of labour." This remark, Dr. Rees suggested, could well be taken as a motto by the National Institute of Industrial Psychology in its great preventive work, or by the Tavistock Clinic. It was undeniable that this century had seen very great progress in both the science and the art of psychological medicine. Moreover, in the treatment of neurosis and

nervous breakdown and in medicine as a whole, the introduction of the principles of medical psychology in the last few years had brought about a greater change than anything else in medicine. In the basic understanding of the processes of mental disease much was owed, of course, to Freud and his followers, but the work of Jung, MacDougall, Adler, Rivers, and Hadfield—to mention only a few—had been of an outstanding quality. Dr. Rees said that there had been wide differences in the point of view of the different schools of thought, and there still were healthy differences—as in every progressive science. But fortunately to-day there was a basis of agreed fact, and the medical student could now be taught to understand the human beings with whom he had to deal without the use of any technical jargon and without any exclusive references to a particular school of thought in psychology. In the actual treatment of the neuroses steady advance was being made. We knew a good deal more than we used to about the way different types of patient reacted to different types of treatment. Some could be helped by very simple means of reassurance, encouragement, and suggestion, others needed a lot of careful investigation, while yet a further group could only get well if they had a very complete and exhaustive, and exhausting, mental analysis. There was evidence from the careful follow-up work which had been done, first of all at the Tavistock Clinic and then at the Cassel Hospital at Penshurst, that approximately 50 per cent. of the patients treated, irrespective of the particular method, seemed to be permanently relieved and socially adjusted. More important perhaps than the provision of treatment for the definite neuroses was the fact that through recent research it was coming to be realized that many of the illnesses which have always been supposed to be mainly physical had in fact a very large emotional factor in their causation.

Memorial to Linacre at Old Brampton

The recent unveiling of a memorial in Old Brampton Church, near Chesterfield, to Thomas Linacre, founder of the Royal College of Physicians of London, was the occasion for a large attendance of medical men and others interested, which included Professor J. A. Gunn, University of Oxford; Sir Arthur Hall, Royal College of Physicians; Dr. Robert Robinson, Wayneflete Professor of Chemistry, University of Oxford; and numerous representatives of the Chesterfield, Buxton, Derby, Sheffield, and Nottingham Divisions of the British Medical Association; academic costume being worn. The memorial, given anonymously by a prominent Chesterfield family, took the form of new oak choir stalls and clergy desks. A bronze memorial plate bears the following inscription:

> These choir stalls were erected in 1938 as a memorial to Thomas Linacre, 1460–1524. Scholar, Physician, Priest. Fellow of All Souls College, Oxford. Initiator and first president of the Royal College of Physicians. Friend and teacher of Erasmus and Sir Thomas More. A member of the Linacre family whose home was for many centuries at Linacre Hall in this parish. To him was chiefly due the revival of classical learning in this country. *Ad Majorem Dei Gloriam.*

The unveiling was performed by the Bishop of Derby, who, from the chancel steps, gave an interesting outline of the career of Linacre. Born in 1460, as claimed by some at Canterbury, but as stated by others and with much greater probability at Linacre Hall, Old Brampton, near Chesterfield, his ancestral home, Linacre became one of the greatest and most versatile scholars of his age. A graduate of Oxford, in 1484 he was elected a Fellow of All Souls. He was probably admitted to Holy Orders early in life, though not ordained as priest until he was 60. As a clergyman he held a number of ecclesiastical offices, the duties of which were performed by deputies. After his election as Fellow of All Souls he went to Padua, first studying Greek and then medicine. He graduated M.D. at Padua and subsequently at Oxford. His profound learning reached the ears of Henry VII, who made him physician and tutor to Prince Arthur. Later in life he was also tutor in Latin to the Princess Mary, afterwards Queen. He is said to have been the first teacher of Greek in England, after the Venerable Bede. Among his pupils were Sir Thomas More and Erasmus. As a physician he lectured on medical subjects in Oxford, and in 1509 was appointed physician to Henry VIII. Among his patients were Cardinal Wolsey, Archbishop Warham, Bishops Fox and Colet, in addition to his two former pupils, Thomas More and Erasmus. He became the first man to put a check on quackery, and it was mainly due to his efforts that the College of Physicians was founded in 1518. Of this institution he was the first president. He died in 1524 and was buried in St. Paul's Cathedral.

The Cancer Bill and the College of Surgeons

In the course of the consultations which he is carrying on with bodies interested in the Government's Cancer Bill, the Minister of Health conferred on January 19 with a deputation from the Royal College of Surgeons of England on a number of points arising out of the Bill. The deputation was composed as follows: Mr. Hugh Lett (President), Mr. G. Grey Turner and Mr. R. E. Kelly (Vice-Presidents), Sir Cuthbert Wallace, Bt., Mr. G. E. Gask, and Sir Charles Gordon-Watson. The deputation presented to the Minister a memorandum which had been prepared by the College drawing special attention to the necessity for early and accurate diagnosis of cancer, increased facilities for the training of radiotherapists, the establishment of a National Cancer Institute, and the appointment of an Advisory Committee on Cancer. The Minister expressed his gratitude to the College for its advice, and promised that the points raised would receive full and sympathetic consideration by himself and his advisers. He informed the deputation that he had already decided to appoint a special subcommittee of his Medical Advisory Committee to advise him on the subject of cancer.

Correspondence

Treatment of Osteomyelitis

SIR,—It is with great interest that I have read the letters of Mr. G. A. Bagot Walters (January 7, p. 37) and of Mr. C. C. Holman (January 14, p. 88). Recently my thoughts have been running in the same direction as theirs, but I have never been able to bring myself to abandon operation entirely, and this perhaps for three reasons. What I have had the opportunity of seeing of the non-operative treatment of osteomyelitis has not been encouraging. All my own training and experience has been of operative treatment, and I have for many years clung to the idea that the type of osteomyelitis which we see here is a very virulent one and have believed, perhaps erroneously, that early release of the bone infection was an essential part of the treatment. However, the fact that the after-history as regards late recurrence of infection in many cases subjected to any operation other than complete resection has been so bad makes one wonder whether the subsequent history of cases treated without operation is better. I think this is of the utmost importance, for, as I have previously pointed out, any treatment if it is to be really satisfactory must not only assure a low initial mortality but must result in the maximum freedom from recurrence of infection in later life, a point which is often lost sight of. My present belief that uleron is of real value is based not only on clinical observation but also on the fact that the blood infection present in my recent cases was proved by repeated culture to have completely cleared up in what seemed to me to be a remark-

ably short time. If uleron or any similar compound is to be of value, it is essential, in order to get the best results, that it should be given at the earliest possible moment in the course of the disease, not after the diagnosis has been fully established, but whenever symptoms appear which in any way suggest the possibility of acute osteomyelitis being present. In reference to Mr. W. Sayle Creer's letter (January 21, p. 137), I did not claim that uleron had reduced recurrence. That claim would be, at present, an absurd one to make.—I am, etc.,

Aberdeen, Jan. 16 ALEX MITCHELL.

SIR,—The treatment of acute osteomyelitis has undergone great changes, as your correspondence columns have lately shown. Probably present ideas are well epitomized by my colleague Charles Donald's advice in another connexion: "Don't let the pus out when there isn't any." Most surgeons do, however, still let it out when there is some, and complete abstinence from operation is perhaps more talked about than practised. The late Mr. Tyrrell Gray did practise it, and stated that he had not operated upon acute osteomyelitis for five years. Unfortunately he seems to have treated very few patients in this way at the Hospital for Sick Children, Great Ormond Street, and an attempt made by a late R.M.S. (Mr. J. C. R. Hindenach) to follow up the results of the work had to be abandoned for lack of material.

Extensive guttering operations are things of the past, and produced the bad results which were published by me, among others, in 1928. The pendulum has very properly swung, and the recent discovery of the value of the sulphanilamide compounds may swing it further. None the less, we are still confronted with the problem of what to do with the acute case seen early and before pus has formed. Modern written opinion would probably favour temporization on the assumption that patients suffering from a fulminating infection will die anyhow, and that the others will stand a better chance in a few days. Yet there are occasions when this does not seem to be the whole truth, as witness the following case record:

Early last year I saw a boy of 6½ years with a temperature of 103° F. and acute tenderness over the upper end of his right tibia of two days' duration. I operated at once, expecting to find localized pus in the metaphysis, but to my surprise and disappointment there was none. There was not even hyperaemia on drilling the bone, but a culture was immediately taken from this and also from the blood, and *both grew Staphylococcus aureus*. The wound was packed with vaseline gauze and plaster was applied, with most happy results. The temperature came straight down to normal and stayed down without the aid of drugs or serum, and the child's convalescence was uneventful for the eight months that he remained under observation.

My friend Mr. C. C. Holman would presumably have temporized. Thirteen recoveries out of his last fourteen cases is a splendid achievement, but is it possible that delay in my case might have produced a replica of his one failure, where "post-mortem examination showed a little pus in one tibia and suppurative pericarditis"? He feels sure that no operation could have saved the child when he saw it (four days before death), but what about four days before that? Nobody knows.

Presumably the reason for awaiting pus formation in soft tissue inflammations (for example, cellulitis, acute adenitis) rests on the sound basis of consequent localization. This will happen to a subperiosteal abscess, but not to one inside a bone except under the special conditions which cause Brodie's abscess. Perhaps the real difficulty lies in the variation in tension necessary to force a way out of the metaphysis. A baby will sometimes drain its own mastoid externally, while another older child may have meningitis or lateral sinus infection almost before Macewen's triangle is tender. Infected material in bone seems to me highly dangerous, but much less so when it has found its way into the soft tissues. Can we do any harm in the early stage by simply draining the focus and leaving the wound open?

We all ought to know more about osteomyelitis, and in the hope of being shot at I hoist the following target (with apologies to Mr. Donald): "Don't let the pus out when there isn't any, *unless it's bottled up in bone.*" (The words in italics are mine.)—I am, etc.,

London, W.1, Jan. 17. ERIC I. LLOYD.

Mechanical Respirators

SIR,—What are hospitals to do now that the mechanical methods of producing artificial respiration are evolving with such bewildering speed? The dreadful emergency of failed respiration divides itself into two categories: (1) short cases arising outside hospitals, such as drowning, electric shock, poisoning by carbon monoxide, mining disasters, etc.; and (2) long cases arising mostly within hospitals—due to diseases such as infantile paralysis and diphtheria—and especially in isolation and orthopaedic hospitals. The first category must be met promptly by Schafer's method. As pointed out by Dr. H. E. Collier (January 14, p. 88) an Eve's rocking stretcher, made by Messrs. Siebe, Gorman of London, will efficiently maintain respiration without trained operators—who soon get tired in Schafer's method. The patient can be put under blankets and hot-water bottles and be transferred—still rocking—in an ambulance to hospital. A doctor is always needed to supervise a free airway. I had a queer case of electrocution (ear to opposite thumb), with spasm of the larynx which, if the heart had not already failed, would have needed a tracheotomy; and Banting has recently found that many drowned patients die of laryngeal spasm without entry of water into the lungs.

The second group of patients needing artificial respiration consists of longer cases, though the issue of death or recovery is usually decided in a few days. But they are far too protracted for Schafer's method, and some form of "iron lung" is commonly assumed to be the only solution. This is far from true. Any apparatus which encloses the whole patient is costly, bulky to store, and needs specially trained doctors, nurses, and mechanics; nursing access is difficult. Any cuirass apparatus if it is to fit the patient must be perishable and must be stored in different sizes. A rocking stretcher fits any patient, but is inadequate, lacking a mattress, in warmth and avoidance of bed sores. Yet the important Grimsby case just reported by Dr. J. A. Kerr (*Lancet*, 1939, **1**, 24) proves that a boy of 9 can be saved after a week's manual rocking on a stretcher (Tor tilter) without unusual nursing difficulties or a specially trained staff. My own original case—after diphtheria in a child of 2—recovered after two days' rocking by the parents in a rocking-chair in their own home (ibid., 1932, **2**, 995; 1933, **2**, 740). The tiltable bed, made by Siddall and Hilton of Sowerby Bridge, Yorkshire, can be rocked manually, and is soon to be made to rock by an electric motor. I hope that this electrically rocking bed may prove the simplest, cheapest, and best solution of the problem, especially in regard to nursing access; a pelvic Y-bandage of cycle inner tubing prevents slipping. Seasickness would seem a likely drawback, but in Dr. Kerr's boy it stopped after the first two hours, and Mr. W. Riley, who has used the rocking stretcher constantly during the past five years on numerous cases and trainees at the

Wakefield Central Mines Rescue Station, writes me that he has not met with any sea-sickness except in one boy (successfully revived after carbon monoxide poisoning) who had just had a heavy meal. I suspect that this immunity may be due to the hyperventilation of rocking—analogous to the new cure for sea-sickness by oxygen inhalation described by Dr. Boothby of the Mayo Clinic.

Each hospital will now be asking whether it is prepared to meet the emergency of sudden respiratory failure. I submit that manual rocking on a tiltable bed meets the actual emergency very simply, and gives time to secure a mechanical respirator if preferred. This bed will not lie idle between emergencies, for it has numerous other uses, shortly to be described.—I am, etc.,

Hull, Jan. 17 F. C. EVE, M.D., F.R.C.P.

SIR,—Professor R. R. Macintosh has ignored my letter in the *Journal* of December 31, 1938 (p. 1389), in which I stated that the type of respirator made by Lord Nuffield was the Drinker, and ought to be called so. If Dr. Drinker had patented his invention, which he had made in wood as well as steel, the respirators to which Professor Macintosh ascribes another name could not have been made without infringement, and yet Professor Macintosh seems to approve of the fact that Lord Nuffield should pay a royalty for each one to someone who is not the original inventor.

The custom of medical men of not patenting inventions which are of service in medicine requires reconsideration in the face of these facts. Sir Frederick Menzies rightly asked who "got at Lord Nuffield," and justly cited Dr. Drinker's opinion that the expenditure is a piece of sentimental foolishness and waste of money—money which might have been spent very wisely in providing a travelling unit of surgeons skilled in the treatment of infantile paralysis, who would go where there were outbreaks of the disease, as suggested by Dr. James Kerr, and would be provided with a few Drinker respirators, to the perfection of which Sir Robert Davis has given so much time and trouble.—I am, etc.,

Chalfont St. Peter, Bucks, Jan. 21. LEONARD HILL.

SIR,—In the *Journal* of January 14 (p. 85) Professor L. J. Witts states that as a result of representation to Lord Nuffield by a committee appointed by the Medical Research Council it is unlikely that the present distribution of mechanical respirators will exceed a total of 500. This statement is incorrect. About 500 will be issued to hospitals in Great Britain alone. This number was estimated (and has since remained unchanged) about the middle of October, long before any communication from the Medical Research Council reached Lord Nuffield. Incidentally in the correspondence between Lord Nuffield and the M.R.C. no number was mentioned. There is as yet insufficient evidence on which to base an estimate of the numbers which will be requested by the Dominions and Colonies.

Sir Frederick Menzies's suggestion of "flying squads" in the same issue was one which had been considered and discarded as impracticable weeks ago. Let us get down to plain figures. Cowley experts estimate that by using mass-production methods and so eliminating wastage during manufacture the cost of the respirators will be about £25 each. Thus 500 will cost £12,500. This capital sum at 3½ per cent. would produce an annual income of £437 10s. It is interesting to speculate as to how many of Sir Frederick's flying squads, each "with the necessary trained medical, nursing, and engineering staff, ready at any time to go out with the respirator to any place . . . required," could be provided out of such an income. Although it is debatable whether flying squads would be preferable to widespread distribution, there is nothing to prevent Sir Frederick from going ahead with this idea. Respirators will be presented to individual hospitals, but if Sir Frederick or any other knight-errant cares to raise the necessary money and persuade the recipients to unite and centralize their respirators at a common headquarters there is no reason why he should not do so. He would be advised first to count the cost—financial and other.

In his letter in the *Journal* of January 21 (p. 134), much of which is occupied in explaining that he has only recently heard of a gift which received world-wide publicity, Sir Frederick attempts to confuse some and avoid most of the issues involved. One of my main regrets at his tardy reply was that it robbed Lord Nuffield of an opportunity of expressing his views. My previous letter states clearly that even if it were improbable that Lord Nuffield's policy would have been influenced by your correspondent's views he (Sir Frederick) could at least have obtained, by writing to Cowley or Oxford, the information his first letter so disingenuously purports to seek.

Sir Frederick's fourth paragraph states: "I never quite understood until I read Professor Macintosh's letter how it came about that Lord Nuffield decided to make such a wholesale distribution of mechanical respirators." I ask Sir Frederick outright if this is true. He has two juniors on the Medical Research Council respirator committee, and one of them certainly has been in frequent communication with Dr. Pratt, physiologist to my department, and has even visited him at Oxford on respirator business. Any inquiries about the "iron lung," verbal or otherwise, from anyone have been fully answered. If Sir Frederick has not discussed the matter fully with his juniors he must now realize he would have saved himself a lot of trouble if he had taken this course. The paragraph continues: "It seems to be clear now that he [Lord Nuffield] had got the idea into his head that mechanical respirators were things used by anaesthetists—not an unnatural mistake for a layman to make." This is another example of Sir Frederick's underestimation of Lord Nuffield's intelligence and interest in medical matters. In the next sentence the statement that "he [Lord Nuffield] was not informed of the appointment of a 'Committee of Experts' by the Medical Research Council" is typical of Sir Frederick's tendentious style. The fact is that Lord Nuffield was informed immediately I knew of it, and I discussed the matter with him again on December 10, in accordance with a promise made by me in a letter to Sir Edward Mellanby on December 9, 1938. At a later date I wrote to the Medical Research Council conveying his lordship's appreciation of their interest in this important matter. It is extraordinary that a man in a public position can see fit to make such a misstatement. May I again remind Sir Frederick of the desirability of ascertaining his facts before committing himself to print; if he had cared to take advantage of my offer to call on him (conveyed in a personal letter on January 13) perhaps I could have put him right on quite a lot of points on which he still appears to be confused.

In accordance with the recognized canons of serious discussion I have endeavoured up till now to confine myself to the statement of facts, unbiased and without distortion. As Sir Frederick declares himself determined to end this correspondence so far as he is concerned it must be left to your readers to decide whether he could have made the same claim.—I am, etc.,

Pembroke College, Oxford, Jan. 23. R. R. MACINTOSH.

Adult Measles Serum

SIR,—In view of the annotation in the *Journal* of January 14 (p. 74), in which comment is made on the results of protective measles serum in the epidemic of 1938, the following figures may be of interest to those concerned with children exposed to measles.

In Eastbourne some 255 doses of adult serum, each of 10 c.cm., were supplied to my colleagues. Of the inoculated, nearly all children, 25.1 per cent. escaped entirely, 43.5 per cent. had modified attacks, and 31.4 per cent. had unmodified attacks. There were complications in 4.7 per cent. of the inoculated (twelve cases: six otitis, four pneumonias, and two bronchitis). No less than 18.8 per cent. contracted measles later than the fourth week after inoculation. The duration of immunity is held to be about three weeks, so that the protection rate for the first four weeks is higher than the figure of 43.5 per cent.

The general impression has been that the cases were milder in the inoculated, but not all practitioners agree on this point. The one item which seems to emerge is that complicated cases were rarer and much milder than usual, and for that reason alone serum is worth while. Protection after the fourth week can hardly be expected. In some cases it failed completely, one case developing measles twenty-one days after inoculation. The serum was given any day from the first to the seventh after the rash in the original case, but my view is that best results are obtained before the sixth day. It is interesting to note that a flat dose of 10 c.cm. of adult serum is recommended by the L.C.C. authorities. This has been our standard dose in Eastbourne for the last two epidemics.

The most difficult problem is that of the medical officer in a large school, where cases keep occurring anything up to two months after the original batch of inoculations. It would seem best to concentrate on contacts rather than go in for mass inoculations, but this is by no means easy, if not almost impossible.

The serum used was a pooled one, and quite fresh and from adult donors who had had measles. Unfortunately, it is difficult to obtain donors of adult age who have had recent measles, but the average adult is usually immune, so that the use of such donors as the above seems logical.—I am, etc.,

A. GEOFFREY SHERA, M.D.
Department of Pathology and Bacteriology,
Princess Alice Memorial Hospital,
Eastbourne, Jan. 16.

Reinfection in Diphtheria

SIR,—The case of reinfection in diphtheria reported in the *Journal* of January 21 (p. 136) by Dr. J. E. Haine might well share with "Typhoid Mary," of pious memory, the distinction of elevation to the textbooks. Those of us who are interested in active immunization against diphtheria have all had experience of the failure of an attack of the disease to confer immunity. It would be interesting to learn whether, at the time when the last positive swab was taken, a Schick test was performed. There may come a time in his eventful struggle against the bacillus when this boy becomes a true carrier, infected but immune. In the *Journal* of January 15, 1938 (p. 120), Dr. F. Pygott records his experience "that cases which do not develop a natural immunity as the result of infection respond satisfactorily to active artificial immunization."—I am, etc.,

Sussex, Jan. 21. H. LYNDHURST DUKE.

Domiciliary Emergency Treatment of Eclampsia

SIR,—Dr. H. J. Thomson's description (*Journal*, January 7, p. 36) of the different conditions in his area as compared with those in Croydon fully explains his decision to treat cases of eclampsia in their own homes. Obviously, a long and probably rough journey by ambulance would be the last thing one would care to submit an eclamptic to. In Croydon the maximum distance such a patient might have to be transported would be five to six miles. Attendances at the clinics in Croydon are very regular owing to their accessibility, and expectant mothers are seen every fourteen days from the twenty-eighth to the thirty-sixth week, and every seven days from then until delivery. It is rare, therefore, for a diastolic blood pressure of 90 mm. Hg to exist undiagnosed for a longer period than two weeks in the first instance and one week in the second. Even so, many cases have a diastolic pressure considerably higher than this. It must be understood, of course, that many cases so admitted have other indications of toxaemia in addition to the hypertension. The routine admission to hospital ensures that rigorous treatment is instituted before the condition has been in existence for long.

In regard to Dr. Thomson's statement about the wastage of infant life, the stage of pregnancy at which these patients develop hypertension must be considered. For instance, of 105 cases admitted in 1937, ninety-four were past the thirty-fourth week. Of the 105 cases, sixty-three came into labour spontaneously, all having live babies, but there were two neo-natal deaths, both babies having been born at the thirty-sixth week, one being a twin. The remaining forty-two were treated by induction, the details being as follows:

Cases Induced Surgically

After 38th week, 15: Infant deaths, 1
36th to 37th week, 2: Infant deaths, 0
32nd to 35th week, 2: Infant deaths, 2

Of the above infant losses, one was a craniotomy for a rigid cervix in an elderly primipara at forty weeks, and one a macerated foetus.

Cases Induced Medically

After 38th week, 19: Infant deaths, 0
36th to 37th week, 4: Infant deaths, 0

(Including two sets of twins at thirty-six and thirty-nine weeks.)

I would like to emphasize that these inductions were carried out in patients whose diastolic pressures had not subsided after about ten days of the most rigorous treatment under the best possible conditions. As thirty-four of the inductions were done after the thirty-eighth week, when, I am sure Dr. Thomson will agree, the infants stood an excellent chance of survival, it seems to me that the danger of infant losses is not so great as he would have us believe.

In mentioning the non-development of eclampsia I certainly did not mean that this was the only danger avoidable by induction. I am afraid I cannot agree with Dr. Thomson when he says this is its only redeeming feature. On the contrary, the longer the hypertension persists the greater the likelihood of stillbirths from placental infarction and accidental haemorrhage, the mother's life as well being endangered in the latter case. Infarcts, accidental haemorrhage, and, indeed, eclampsia itself may all occur with no other sign than the presence of hypertension. Surely, then, its persistence, even in the absence of other signs and symptoms, should be looked upon with the gravest suspicion.

In support of the above may I quote F. J. Browne (*Antenatal and Post-natal Care*), who says, in the chapter on acci-

dental haemorrhage (p. 199): "Cases have been observed in which the patient had hypertension only without albuminuria or other signs of kidney involvement"; and (p. 200): "There is reason to believe that some at least of the varieties of placental infarcts are comparable in their mode of production to accidental haemorrhage"; and again (p. 202): "The primigravida and the multipara are equally liable to accidental haemorrhage. The former is more liable to pre-eclamptic toxaemia with hypertension, the latter to chronic nephritis with hypertension. The only factor common to both is the hypertension."

I must confess I do not know how to take Dr. E. K. Mackenzie's letter (January 7, p. 37). He appears to have made my communication the basis for a denunciation of all modern clinics. I do not know on what grounds he does so. The last two paragraphs of his letter need no answer. May I, however, ask him for a little more information about the 100 cases he refers to. How many of them have had subsequent pregnancies; did any have a recurrence of hypertension, and, if so, to what degree; and are there any signs of renal impairment in any of the cases? At what stage of their pregnancies did they develop the diastolic pressure of 90 mm. Hg or over? In regard to the case which had a diastolic pressure of 160 mm. Hg, would he kindly say for how long this was sustained and what her blood pressure is now? It would also be of interest to know the height to which he would allow a diastolic pressure to mount before he considers any form of intervention necessary, if at all.—I am, etc.,

Croydon Obstetric Service, Jan. 23. RUFUS C. THOMAS.

Treatment of Sterility

SIR,—In regard to the examinations of semen the figures given by Miss Margaret Moore White (*Journal*, January 14, p. 62) are of an interest limited only by the small number of cases examined—namely, thirty-nine. An investigation of this factor is in progress at the Hospital for Women at Leeds and will be reported in due course. Up to the present 166 cases have been examined, with the following results: normal, 73 cases (44 per cent.); oligospermia, 63 cases (38 per cent.); aspermia, 30 cases (18 per cent.). It may be that the better cases in the oligospermia group are not infertile, but the majority of them have very low counts indeed. The relationship between the *p*H of the fluid and other factors is also being investigated. Certainly in the Leeds series the proportion of cases of male infertility will be much higher than either Miss Moore White's figure or those usually accepted. Another point to which some importance is attached is the time at which dilatation and curettage is undertaken. It is our custom to curette always a week before an expected period. In this way, by the examination of the endometrium for the secretory phase, it is possible to see whether the patient is ovulating.—We are, etc.,

D. W. CURRIE,
Honorary Assistant Surgeon.

N. LISSIMORE,
Pathologist.

Hospital for Women, Leeds, Jan. 17.

Radiotherapy for Metrorrhagia

SIR,—I read Dr. James F. Brailsford's letter (January 14, p. 86) on the treatment of metrorrhagia with much interest. The letter is a timely one and should serve to remind the profession that *x*-ray treatment in many conditions can achieve its best results without causing the patient any serious distress. Even in many forms of malignant disease graduated dosage has often been found to relieve symptoms and prolong life from five to ten years, whilst occasionally permanent results have been achieved. Drastic dosage, such as is followed by permanent tissue damage and suffering, too often fails to achieve its object.—I am, etc.,

London, W.1, Jan. 20. J. E. A. LYNHAM.

New Menstruation Toilet

SIR,—I have read with interest the comments in recent letters on the use of the internal sanitary pad. Many of my patients here are anxious to make use of this method as being more comfortable under tropical conditions. I have warned them against possible infection, and I feel this warning has been justified. Only last week I saw two cases of severe vaginal discharge definitely resulting from the use of these pads, one with an associated pruritus. Infections of the cervix flourish in this climate, and the use of the internal pad, whether infected or not, certainly seems to act as an irritant. Surely their use is unwise.—I am, etc.,

Lusaka, Northern Rhodesia, Jan. 9. F. ADAM-THOMSON.

Circumcision

SIR,—Referring to the letters about circumcision, all the authors seem to have complications after the operation or anticipate them. When I was at the Birmingham Medical Mission as surgeon I did hundreds of circumcisions among dirty children in the following way, without sepsis or other troubles.

The children were anaesthetized with the old ether-and-chloroform mixture applied on a mask with many folds of gauze. The prepuce was cut so as to avoid as much of the fraenum as possible. The internal skin was cut in two flaps and all bleeding points ligatured. Three sutures were then put in, one at the fraenum and two on the dorsum. All these ligatures and sutures were of No. 0 catgut. The last and most important procedure was the dressing. Before the operation a strip of half-inch iodoform ribbon gauze was cut, 10 inches long, with one end split into two legs about 2 inches long. This ribbon was wound round the prepuce at the cut and the two legs tied once, not too tightly. Lastly, tinct. benzoin. co. was dabbed on the gauze till wet through and the child was taken back to its mother, with instructions to blow on the dressing for a quarter of an hour, and on no consideration to touch it. This dressing stayed on till it came off in seven days or so like a finger ring. Healing was by first intention. Of course the ancestral dirt was well washed off with antiseptics before the operation.

—I am, etc.,

Birmingham, Jan. 17. J. SANDISON CRABBE.

Cyclopropane and Pulmonary Atelectasis

SIR,—From the correspondence on this subject it would appear that some doubt exists as to the importance of the administration with anaesthetics of an abnormally high proportion of oxygen in regard to the subsequent development of pulmonary atelectasis or massive pulmonary collapse. Some observations of mine on this question during an investigation into post-anaesthetic respiratory complications (University of Glasgow thesis) may therefore be of interest.

Out of 290 patients anaesthetized with chloroform–ether mixtures or sequences, eleven developed such complications; whereas of sixty-eight anaesthetized with similar anaesthetics but with the addition of oxygen sufficient to produce some degree of apnoea eight developed complications—that is, more than three times as many. An analysis of the individual complications produced showed that in the two groups the incidence of bronchitis and other complications except atelectasis was almost identical;

practically the whole increased incidence in the "oxygen" group was due to cases of atelectasis.

The hypothesis put forward by Dr. Philip Ayre in the concluding paragraph of his letter (*Journal*, December 17, 1938, p. 1279) would therefore seem, so far as this investigation went, to be abundantly justified.—I am, etc.,

Burnley, Jan. 17. A. DUFF, M.D., F.R.C.S.Ed.

Ulcerative Colitis

SIR,—Personal experience of ulcerative colitis tends to confirm Sir Arthur Hurst's contention (*Journal*, January 14, p. 85) that the aetiology of this condition is of a two-fold nature—some form of infection acting on a "predisposed bowel." The primary infection may cause only slight and temporary symptoms, and these may be overlooked and forgotten when the first real flare-up of ulcerative colitis occurs some time later. As regards treatment, the first essential is to avoid anything that is at all likely to irritate the bowel and aggravate the condition, particularly in the acute form. The acutely inflamed bowel requires as much rest as possible. All forms of local treatment, such as bowel wash-outs, should be taboo. Substances to give bulk to the stools usually only cause further irritation. If severe haemorrhage is a marked feature opium should be more freely given. Apart from rest in bed and a suitable and adequate diet (Bargen's diet is an excellent example), the sheet-anchor of treatment, especially in the acute pyrexial stage, should be blood transfusion. This should be repeated until a normal haemoglobin level is obtained. Iron, which is usually recommended, even in comparatively small doses, may aggravate many cases of colitis. Blood transfusion, moreover, seems to have a beneficial influence on the course of the disease far beyond that due to the general improvement in the blood. This is most striking when the transfusion is followed by a reaction and a high temperature, and is probably a non-specific protein effect. In fact, many simple uncomplicated conditions with temporary acute pyrexia may result in improvement in the colitis. I have seen such improvement follow a simple influenza, and it raises the question whether there is a field for the treatment of the chronic condition by artificial pyrexia.—I am, etc.,

Leeds, Jan. 16. M. GORDON.

Bilateral Rupture of Quadriceps Tendon

SIR,—In the *Journal* of December 31, 1938 (p. 1369), Mr. K. L. James quoted a case of bilateral rupture of the quadriceps tendon. As this accident is apparently so rare it may be of interest to record a further case.

On September 13, 1935, a man aged 59 was admitted to the Connaught Hospital suffering from this painful condition. He was operated upon the same evening, both legs being treated simultaneously, Mr. R. Vaughan Hudson doing one while I did the other. Both knee-joints contained blood and both tears involved the vasti muscles. There was no necessity to drill either patella as there was sufficient muscle still attached to each bone to allow a satisfactory suture. Silk was the material used. The wounds healed by first intention, and apart from a marked pyrexia for the first three days the patient made an uneventful recovery. Massage was begun on October 6, 1935, when the movements of the knee-joints were already good. He was discharged on October 15, and when later seen in the out-patient department full function had been restored.

I must thank Mr. R. Vaughan Hudson, under whose care the patient was admitted to the Connaught Hospital, for permission to quote this case.—I am, etc.,

MAXWELL LANDAU,

Gravesend, Jan. 9. Hon. Asst. Surgeon to Fracture Clinic, Gravesend and N. Kent Hospital.

Seasonal Influence of Rheumatic Fever

SIR,—I should like to express my appreciation of Mr. F. Garwood's criticism (*Journal*, January 7, p. 38) of my article appearing in the *Journal* of July 2, 1938 (p. 15).

I agree that the statistical evidence *per se* is insufficient on which to base my conclusions. That the similarity of form of Graphs 2 and 5 might be in the nature of a coincidence is a very definite possibility, viewing the matter from a purely statistical angle. Proof of this is obtained from a study of the seasonal incidence of scurvy and rickets, where the incidence is approximately an inverse edition of that for rheumatic fever, but quite unrelated to the rate of change of temperature. This is undoubtedly due to a phase lag between the seasonal variation of radiant energy and the synthesis and saturation of the body with vitamins. It would appear that in rheumatic fever we have to decide whether the seasonal incidence is a phase-lag phenomenon or whether it is directly controlled by the rate of change of temperature and relative humidity. In support of the latter view we have the clinical impressions of Poynton and Schlesinger (*Recent Advances in the Study of Rheumatism*): "Sudden atmospheric changes to damp cold after a long spell of dry, hot, and dusty weather are, in our opinion, likely to lead to the first attack."

Mr. Garwood's suggestion of using data for several years is one that I have considered in the past. Unfortunately, rheumatic fever is not notifiable in this country, and, therefore, the practical difficulty lies in finding the necessary data. This objection does not hold in the case of Scandinavia, where the disease is notifiable. Indirect light may also be thrown on this aspect of the problem by the varying seasonal incidence of scarlet fever and diphtheria in different years. Any attempt to relate the incidence of rheumatic fever (scarlet fever, or diphtheria) in this country to simple harmonic curves reveals the possibility of a second climatic factor, which robs the possibility of correlating departures from a harmonic curve of much of its value. I will not comment further on this second factor, except to state that it probably accounts for the apparent increased vernal prevalence of throat infections on the eastern seaboard of North America.—I am, etc.,

Hendon, Jan. 14. ARNOLD B. ROWLANDS.

Vitamin D in Diet

SIR,—We would request the courtesy of your *Journal* for a short comment on two points arising out of the paper "Vitamin D in Diet: Palatable Methods of Supply," in your issue of January 7 (p. 14), and out of your editorial on nutrition of the school child in the same issue (p. 24). Miss Lindsay and Professor Mottram make the following statement: "As the oil of herrings is credited with 10,000 international units per 100 grammes (Boas-Fixsen and Roscoe, 1937–8). . .". From long experience we have never found any samples of genuine herring oil that contained anything like as much vitamin D as would be indicated by these figures. Herring oil at 10,000 international units per 100 grammes, equal to 100 units per gramme, would be a valuable commercial source of vitamin D. It does not figure at all in this light.

The most recent biological test we have available is on herring oil caught off the East Coast of England produced during the midsummer of 1938 from fish in prime condition. This oil, tested biologically using sixteen pairs of rats, showed only twelve international units per gramme, even though it was known from its origin to contain a significant amount of fish-liver oil from other species—

almost enough to account for the bulk of the vitamin value.

The other point is in relation to the effects of cooking on the vitamins A and D of cod-liver oil. In this the user is amply protected. Cod-liver oil, as an oil, is of such delicate character (presumably owing to the highly unsaturated nature of the fatty acids of the oil) that it is peculiarly susceptible to damage by oxidation, heat, and other adverse circumstances. In fact, what might be termed "the edible character of the oil" is completely destroyed long before the vitamin A and D values are at all affected. The dishes described by Miss Lindsay and Professor Mottram would be entirely unthinkable from an edible point of view if any actual damage had been done to the vitamin A and D content during cooking. Much of the prejudice, in fact, which exists against cod-liver oil has been due to maltreatment of the oil in the past, a thing that has given the oil a harsh unpleasant fishy character altogether absent from the oil as it exists in the liver of the fish. The best grades of British production are now free from this defect.—I am, etc.,

K. MACLENNAN,
General Manager, British Cod Liver Oil Producers (Hull) Ltd.

Jan. 16.

*** We have referred Mr. MacLennan's letter to the authors of the article and their reply follows.—ED., *B.M.J.*

SIR,—The main purport of our article, "Vitamin D in Diet: Palatable Methods of Supply," was to point out that there are few articles of normal diet which provide adequate supplies of vitamin D and that cod-liver oil could be used in the preparation of fish dishes. That Mr. MacLennan had found lower figures for herring body oil than the ones quoted was known to us, but we felt it incumbent on us to quote Boas-Fixsen and Roscoe, as their figures come from an almost official compilation used by everyone in Great Britain interested in dietetics. Communication of Mr. MacLennan's finding had already been made to one of the authors of that compilation before his letter to you reached us. Doubtless in further editions of that compilation the figures for the vitamin D in the body oil of herrings caught off the coast of Great Britain will be inserted. Such will strengthen our contention that there are few foods which are a reasonable source of vitamin D, and that fish-liver oil should be regarded as a food and not as a medicine.

The second part of the letter is hardly relevant to our case, but doubtless anyone who uses fish-liver oil in cooking will use an oil which has as little offensive odour as possible.—We are, etc.,

JESSIE LINDSAY,
V. H. MOTTRAM,
King's College of Household and Social Science.

London, Jan. 19.

Play Therapy and Child Guidance

SIR,—I am glad to find from the letter in the *Journal* of January 14 (p. 88) that Mrs. Susan Isaacs is in agreement with me that the play therapy used by myself and my co-workers differs "both in technique and in interpretation of results" from that of child psycho-analysis. Coming as this does from a distinguished educationist, herself a member of the Psycho-Analytic Society, I think we may now take it that the last word on this subject has been said, and that we are in full and authoritative agreement. This will make in every way for the quiet development of both techniques.

As regards the questions of origin, Mrs. Isaacs is here under a misapprehension. Both the quotation which she cites from an earlier paper of mine, in its full context, and the question of the origin and history of my own work are fully considered in a paper read by me to the medical section of the British Psychological Society in March, 1938, and which, together with the discussion to which the paper gave rise, Dr. Rickman tells me is appearing in the next issue of the journal of the section. While I felt then, as I feel now, the warmest admiration for Mrs. Melanie Klein as a pioneer worker, and while I, as must all child psychologists, recognize the immense help her work has been to us all, in stressing the importance of child psychology and turning the attention of therapists to child psychotherapy, I have never at any time had any contact or connexion with the work of Mrs. Klein. I had been groping along in my own way for several years in the search for a play approach to children before my friend Dr. Grace Pailthorpe told me of the existence in Germany of a worker who was also using toys with children, and invited me to attend the reading of a paper by her in England.

The few minutes' conversation that I had with Mrs. Klein after that paper—the one in 1927 referred to by Mrs. Isaacs—constituted my total personal contact with Mrs. Klein. Having had myself partly a Continental childhood, the toys I use were part of the experience of my own childhood, and to introduce them into my own work with my own children seemed so natural and ordinary a step as hardly to call for a special "inspiration." The form of the development of that part of my work after that date is set out in the paper referred to above.—I am, etc.,

London, W.1, Jan. 14. MARGARET LOWENFELD.

Social Pathology

SIR,—I had hoped that one of our leading medical women would have replied to Mr. Morley Roberts's intriguing letter in the *Journal* of December 31, 1938 (p. 1392).

No one will deny that fertility is the result of fertilization, but many of us will deny that promiscuous fertilization will remedy the loss of national fertility. For one thing, most women resent being regarded as breeding stock—to be classed with man's "ox, his ass, and anything that is his." Again, women realize perhaps more clearly than men that cultivation is as important as fertilization, and a home is necessary for the full development of a well-balanced human being. The orphaned child is a psychological cripple, whether he is orphaned by the death of a parent or the congenital absence of a parent. In fact, I believe the mental trauma to be greater in the latter case.

Many of us will agree that the economic system is wrong that caused my male contemporaries to be wiped out at the age at which, according to Mr. Morley Roberts, we should have been replenishing the earth, and forced me to produce my first baby at 36 and stop at two. A few shillings off the income tax next January won't pay for the extra pint of milk to-day, the large house, or extra domestic help. Some system of "young-age pensions," as he suggests, would greatly improve the birth rate. But I agree with Dr. A. Piney (January 7, p. 40) that at the root of the bad economic system is the want of a true morality.—I am, etc.,

Lee-on-the-Solent, Jan. 16. EMILY A. C. WILSON.

SIR,—I think most people will admit that one of the characteristics of this century has been the continual and increasing struggle of women for independence. Surely the spirit underlying this movement is on a sound biological and psychological basis, and is the same as that

underlying the unending struggles for independence of "oppressed" peoples and classes and sects throughout history. It is the object of every living organism to live and reproduce, but primarily to live. The most certain way of maintaining life is to build up sufficient power to control the environment that surrounds you. This is Professor Huxley's definition of progress. Or, to put it briefly, the only way to be sure of your life is by being the "top dog." The behaviour of countries and society bears out this contention.

Woman has for generations been equated with man as weak with strong. She has been in a state of complete economic dependency on her husband—that is, she was in no position to control her environment. Therefore, as always happens, so soon as the "top dog" gets either weak or lazy the "under dog" sees a chance to overthrow him and gain that safer position. The great war gave women that chance. They see themselves on the logical road to the fulfilment of that biological ideal, and Nature, being both short-sighted and caring only for the victory of the strong, urges them on. Domesticity and childbirth are to them the hall-marks of that insecure, biologically unsound state of inferiority and dependency. They therefore deride and avoid them. This surely is the reason for our falling birth rate. Germany has reversed her falling birth rate by the simple expedient of putting women back at their fireside. Whether this could be done here without a major social and political upheaval I am inclined to doubt. The only other alternative is, as Mr. Morley Roberts points out, to subsidize birth of all kinds, and to provide after-care, etc. But until their present sense of inferiority has been worked off I must admit that I am pessimistic even of that method.—I am, etc.,

F. S. A. DORAN, M.B., B.Chir.

Biddulph, Stoke-on-Trent, Jan. 16.

"The Spinal Lesion"

SIR,—Dr. Kenneth Wolferstan (January 14, p. 88) accuses me of implying in my previous letter (December 31, 1938, p. 1394) that it is possible by palpation to appreciate that one vertebra had moved on its fellow "a fraction beyond the extreme point of normal extension," whereas I stated that palpation was capable of revealing tension in the spinal muscles and lack of normal movement between the individual vertebrae. These two findings, muscular tension and fixation, are the cardinal signs of the spinal lesion. The first defies demonstration on an *x*-ray film, and the second is exceedingly difficult to demonstrate even in the lumbar spine. As to Dr. Wolferstan's condemnation of the reliability of the sense of touch, surely surgical diagnosis would be well-nigh impossible if only things seen were believed.—I am, etc.,

London, W.1, Jan. 19. W. HARGRAVE WILSON.

"Should Medical Charity begin at Home?"

SIR,—It is good that Dr. Henry Robinson's letter should have been promptly answered by Mr. Philip Vos and Dr. N. Pines. It is surely time that people in responsible positions should cease to give uncritical support to the popular error that an influx of refugees is a source of deprivation to natives. It is true that individual cases of displacement from employment arise, but equally true that the general economic position (including that of the medical profession) is improved by immigration and not degraded. This question is fully dealt with in an admirably clear pamphlet by Dorothy Frances Buxton (Focus Publishing Company, Devereux Court, Strand, W.C.2), and I am taking the liberty of sending a copy of this to Dr. Henry Robinson, whose letter in your issue of January 14 is intended to discourage us from helping in the work of rescuing German and Austrian refugees from their miserable and dangerous position.—I am, etc.,

Inverness, Jan. 21. D. G. LEYS.

SIR,—I deeply deplore the letter of Dr. H. Robinson, Chairman of the B.M.A. Charities Committee, in the issue of January 14. Merely on grounds of common ethics, I consider that to deprecate help to Jewish refugees is selfish and wrong. The worst that might befall a dependent of a doctor who dies penniless is the workhouse, and a British workhouse would be regarded as paradise by a Jew in a German concentration camp. On the lowest grounds of national self-interest, refugees have throughout the centuries been a source of strength to this country. Surely no doctor can object to the admission of one foreign doctor to every 1,000 refugees, the proportion of patients to doctors already in the land. But every Christian will consider it his bounden duty to help these sufferers whose only lot in their own country is destitution and death.—I am, etc.,

Colchester, Jan. 18. M. E. LAMPARD, M.D., M.R.C.P.

SIR,—Does Dr. Henry Robinson seriously contend that the establishing of a limited number of foreign medical practitioners in this country will lead to the increase of our own doctors having to appeal for charity? If so, I maintain that he is talking nonsense. I am amazed that the Chairman of the B.M.A. Charities Committee should lack those first principles of Christian charity which, so far as I know, are meant to apply to all, irrespective of creed or nationality, and which, quite rightly, Lord Baldwin underlined.—I am, etc.,

London, N.16, Jan. 17. M. N. OSTER.

Air Raid Precautions

SIR,—The question whether scientists or doctors should engage in political activities may be a debatable one, but all who feel how right Mr. J. Johnston Abraham is in his advocacy for deep bomb-proof operating theatres and wards (*Journal*, January 21, p. 133) may also feel that a personal approach to "people of influence" may not accomplish much. But if people of influence in the medical profession were to organize and speak with one voice there is a greater chance, though perhaps a remote one, that the Government might hear.—I am, etc.,

London, N.W.1, Jan. 21. JOHN BRAY.

Wanted: A Case of Acute Poliomyelitis

SIR,—At a meeting of the Metropolitan Counties Branch of the B.M.A. in December I suggested that in acute poliomyelitis the perivascular inflammation with oedema in the central nervous system might produce a local deficiency of oxygen (local tissue anoxia) and that this might be a factor in causing the paralysis and hindering the return to normal. Such a hypothesis can be tested by means of an efficient oxygen tent, which will raise the partial pressure of oxygen throughout the body to three or four times the normal. If true, a new treatment will be made available. Mr. R. W. Paul has kindly placed a Bragg-Paul respirator at my disposal, so that any failure of the respiratory muscles can be simultaneously treated while the patient is in the tent.

Now poliomyelitis has practically disappeared from the teaching hospitals, and since that date inquiries from public authorities have failed to produce a case, while the

epidemic still continues! Can any of your readers help me? The case must be early and paralysis should be marked. With adequate precautions such treatment can do no harm, since I have already had other patients with suspected local tissue anoxia in a tent for a month or more without harm, and this length of time would be ample to show whether there is anything in the hypothesis or not.—I am, etc.,

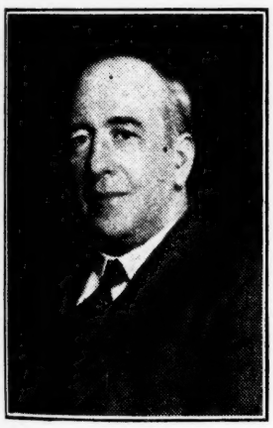
25, Upper Wimpole Street, W.1, Jan. 23. E. P. POULTON.

Obituary

H. H. WOOLLARD, M.D., D.Sc., F.R.S.

Professor of Anatomy, University College, London

The death of Professor Herbert Henry Woollard at the age of 49 has robbed anatomy of one of its outstanding teachers and investigators. In both capacities his qualities were unique, and his early death will be mourned and deplored because there can be no replacing of men of his individuality. Even more will his loss be felt because he was a mainspring of the movement to divert British anatomy from an overwhelming preoccupation with the older techniques of morphology to a discipline which also extends knowledge by the experimental method. For, although he entered academic life and research at the relatively late age of thirty, it was his rare distinction to have added to anatomy not only by his own discoveries but also by influencing the activities of anatomists throughout Great Britain. He never tired in bringing to the notice of workers in this country—few of whom, if indeed any, were as informed as he in the literature—the progress of experimental anatomy elsewhere. Through his book *Recent Advances in Anatomy*, published in 1927, through his dominating influence in the Anatomical Society, through his patient and generous encouragement of younger anatomists, and, since 1932, through his position on the editorial board of the *Journal of Anatomy*, he made his presence and influence felt. If British anatomy is to-day a more progressive subject than it was when he entered it, the change is largely due to him.



Woollard qualified in medicine at Melbourne University in 1910 and gained his M.D. in 1912. He distinguished himself in the Australian Medical Service during the great war, in which he rose to the rank of lieutenant-colonel. At its conclusion he entered University College, London, in order to begin work for the Fellowship of the Royal College of Surgeons. Here he came under the influence of the late Sir Grafton Elliot Smith, who was then at the height of his brilliant and inspiring career, and like Professors Shellshear and Dart, two fellow-Australians whose experiences up to this point had been similar to his, he decided to become a professional anatomist. With the exception of a year spent as a Rockefeller Research Fellow in Professor Weed's department at Johns Hopkins, Woollard remained at University College until the end of 1927, first as demonstrator and later as assistant professor. In 1928 he was appointed to the chair of anatomy and histology in Adelaide, returning to this country two years later to take up the chair of anatomy at St. Bartholomew's Hospital. In 1936 he left St. Bartholomew's in response to an invitation to succeed Elliot Smith in the chair of anatomy at University College, and it was there that he died, a year after he was elected to a Fellowship of the Royal Society, and at the beginning of what promised to be as flourishing a phase of life as any that had preceded it.

Woollard's first studies were mainly on the comparative anatomy of the primates. His monograph on *Tarsius*, the *magnum opus* of this phase of his career, and a record of an investigation stimulated by Elliot Smith, has already served, and without doubt will continue to serve, as a model of what systematic morphological description should be. Other publications of this period are distinguished by the same breadth of vision and meticulous attention to detail as is the study of *Tarsius*; but in spite of their considerable success, Woollard soon abandoned this type of study for the more vigorous field of neurological anatomy, a field in which he was able to employ experimental methods to supplement those of traditional anatomy. He did not, however, lose interest in primate studies, a fact amply borne out by his later investigations of Australian aborigines (in particular his inquiry into their blood groups). Woollard's neurological researches were immediately fruitful. Discoveries regarding the innervation of the heart and blood vessels broke new ground, and led him, partly through his strong interest in clinical problems, to undertake a systematic investigation of the anatomy of the sympathetic nervous system. From this it was but a short step to investigations of afferent innervation and referred pain, and then to a study of the relation of different types of nerve-ending to different kinds of skin-perception. In these latter studies Woollard was his own experimental animal, but the discomforts which he suffered as a result of his experiments were more than repaid by the remarkable observations to which they led.

Woollard was a tireless worker, a generous and ready collaborator, and a man whose personality and inspiration were driving forces to the energies of others. His students and those who worked with him were united in their devotion, and Woollard in his turn was never grudging of praise. If at times he was outspokenly critical, his remarks were offered with such grace that they never gave offence. He was deeply interested in every branch of medical research, and he was constant in his attendance at the meetings of several scientific societies. Above all, Woollard was a man whose good opinion was an honour and whose friendship was a privilege. The movement to vitalize anatomical teaching and research in this country in which he played so prominent a part will not stop. But it was a cruel blow to British anatomy when Woollard was cut down at the very height of his powers.

Mr. Kenneth Walker writes:

May I be permitted to add a footnote to whatever obituary notice is appearing in your columns of Professor H. H. Woollard? It is often said of older men that they inspire the work of their juniors. Never has this been truer than in the case of Professor Woollard, the only difference, perhaps, being that Woollard inspired not only the work of younger colleagues but of his contemporaries. If one had an idea of modifying an operation, of approaching an organ in a slightly different way, then it was necessary first to discuss the question with Woollard. If a new line of research had suggested itself it would be

wise to discuss methods with him. There was no problem on which he would not throw some new light, no subject one could discuss with him without going away with something fresh and illuminating to think about. When lunching at St. Bartholomew's I made every effort to sit next to him, knowing that I would never come away without having learnt something new. What made these talks with him so delightful and so exciting was that one never knew where they would end. A question concerning the anatomy of the pituitary would end with a discussion of the views of Bergson and Anatole France. It is no longer possible "to talk it over with Woollard," and it is not only the young men who will miss him.

[The photograph reproduced is by Russell, London.]

R. A. McCREA, M.B., B.CH.

Late Physician, Chesterfield and North Derbyshire Royal Hospital

By the death of Dr. R. A. McCrea the Chesterfield Division of the British Medical Association has lost one of its oldest and most respected members. An Irishman, McCrea was educated at Queen's College, Galway, and Belfast. He went to Chesterfield as partner in a large general practice thirty years ago, and was one of the original members of the Chesterfield Division at its inception in 1912. A member of the Executive up till two years ago, he successively occupied the positions of chairman of the Division, member of the Midland Branch Council, president of the Derbyshire Branch and member of its council, and, for almost the whole of that time, honorary treasurer of the Chesterfield Division. During this long period he was always a valued adviser and colleague. Moderate in his views on medico-political questions, he was a consistent supporter of the policy of the Association and a strong upholder of the interests of his profession.

During his professional career Dr. McCrea occupied many important positions. For over thirty years he was medical officer of health for the Old Brampton and Walton Urban District Council. In 1920 he was appointed honorary physician to the Chesterfield and North Derbyshire Royal Hospital and in 1929 coroner for the Hundred of Scarsdale, covering Chesterfield and a considerable area around. As coroner he conducted about 170 inquests a year. In 1935 he was appointed a justice of the peace for the borough of Chesterfield. In 1932 he retired from practice, but this by no means closed his career of usefulness. He still retained the offices of coroner and physician to the hospital, and, in addition, devoted himself to public life as a member of the Chesterfield Borough Council. A borough councillor since 1921, he became an alderman in 1937 and was mayor in 1923–4. In addition he held the positions of chairman of the Health Committee, of the Maternity Hospital Committee, and of the Infectious Diseases Joint Hospital Committee. In one or other of these capacities he was responsible for many developments in the public health work of the corporation, notably the new abattoir and the new maternity hospital, now in course of erection. In politics he was a strong Conservative, and was chairman of the Chesterfield Conservative Association.

Owing to ill-health Dr. McCrea was forced to give up all these multifarious activities about twelve months ago. A visit to the South of England brought no improvement, and he died on January 14. He leaves a widow and one son and daughter. The funeral took place at Old Brampton on January 16, and so large and representative a gathering of every possible interest as was witnessed on that occasion has rarely been seen in Chesterfield.

T. E. CECIL COLE, M.A., M.D., M.R.C.P.

Consulting Physician, Warneford Hospital, Leamington Spa

By the sudden death of Cecil Cole on January 7 Leamington has lost an important medical landmark. He was 67. The son of Thomas Cole, M.D., F.R.C.P., he was born at Bath, and was educated at Bath College and Christ Church, Oxford. St. Bartholomew's was his hospital, and he graduated M.B., B.Ch. in 1901, M.D. in 1904, and became M.R.C.P. in 1906. His natural tendency was towards practice in a spa town, and he went to Leamington as soon as he was medically equipped for the purpose. His ability was soon recognized by his election to the staff of the Warneford Hospital, first as medical registrar, and later as honorary physician, which position he held until two years ago, when, by reason of the retirement age, he became consultant to the hospital for which he had laboured for thirty years. During this time he was chiefly responsible for all the improvements in pathology, radiology, and physical medicine at this institution, where his generosity and kindness will be ever remembered.

Cole was scholarly and cultured, of wide vision and few words—these were often direct and incisive, but his friends knew that however trenchant might be his language his heart was golden. He was an esteemed Freemason, and held high honour in the Grand Lodge of England. In the society of his brethren he was at his best, and here his absence will be most profoundly felt. His patients loved him. As a physician following in the footsteps of the direct successors of Dr. Jephson he combined the qualities of a past generation with those of the most recent investigators, thereby making his opinion as a consultant of great value to his colleagues, by all of whom he will be sadly missed. He had been a member of the British Medical Association since 1901, was honorary secretary of the Warwick and Leamington Division for twenty-five years, and chairman in 1931–2.

THE LATE PROFESSOR MORISON

Dr. Robert A. Welsh writes:

As an old student of the late Rutherford Morison who remembers his arrival in Newcastle an unknown man, I have knowledge of a few remarkable facts about him. When he first came he had nothing much to do, so he filled in his time teaching us anatomy in the dissecting-room and giving little simple lectures on instruments and on surgical subjects. He was a fascinating teacher, and we had our interests in these things aroused as we never had before. He used to say he meant to practise pure surgery and nothing else, and he had been told by one of the senior surgeons at the old Infirmary that at that game he would never make bread-and-butter in Newcastle; but Morison soon changed all that. He had no appointment at the hospital then, but he spent much of his time there looking on. One day there came along a man with a large growth in the root of his neck. The surgeon under whose care he was could do nothing with it, and a consultation was held on the case by the whole of the surgical staff, and the unanimous opinion was—it was inoperable, and the patient was sent out. Some time later this patient again turned up pleading for "something to be done"; he was prepared to take any risk if only they could "do something." The surgeon under whose care he had been was away from home, and Morison was in charge of the ward. He saw this case, and told him he would try to remove it, and he did so successfully; when the honorary surgeon returned from his holiday one of the first things he saw was the tumour in pickle and the patient comfortable in bed and very pleased with himself. This case became known, and marked out Morison as an outstanding man. He soon had as much "pure surgery" to do as he could manage,

and his future in the North was one of unbroken triumph. He made surgery in the North of England. His record is a very remarkable one, as his obituary notices show. What intrigues me, and I think many hundreds of his old students, is why such a man was never in his lifetime honoured by his King and country.

Dr. Theodore Craig writes:

I was delighted to find that your notices of the death of my old friend covered more than three pages of the *B.M.J.* That is a real tribute to a marvellous personality. At the meeting of the executive of the Newcastle Division—the day after Morison died—I made the shortest speech of my life: "Morison was a great man who never made any man feel small and helped hundreds of small men to be greater and better men." I knew and loved Morison for more than thirty years, and I would like to pay my brief tribute to his memory.

Mr. CHARLES FIRMIN CUTHBERT, who had been a leading figure in Gloucester, died at Felixstowe from pneumonia on January 9 at the age of 81. He joined the British Medical Association fifty-six years ago, and was a member of the Council from 1906 to 1909. He received his medical education at St. Bartholomew's Hospital, qualifying M.R.C.S. in 1879 after having taken the L.S.A. in the previous year. He became a Fellow of the Royal College of Surgeons of Edinburgh in 1911. Beginning practice in Gloucester about fifty years ago, he was a prominent figure in the medical and public life of that city. He had been connected with the Children's Hospital there for about thirty years, and was the first senior surgeon of that institution. He was also surgeon to the Gloucester Lying-in Charity and the Wotton Nursing Home for Children. To his surgical abilities he added special administrative zeal and knowledge, and was prominent in securing the enlargement and bringing up to date of the Children's Hospital, to which he was latterly consultant surgeon. He was Sheriff of Gloucester in 1911-12. Mr. Cuthbert served as vice-president of the Section of Diseases of Children at the Annual Meeting of the British Medical Association at Cheltenham in 1901, was a representative on the Representative Body at the Leicester Meeting in 1905, and also president of the Gloucestershire Branch in that year. He had been a member of the Gloucestershire, Worcestershire, and Herefordshire Branch Central Council. In his younger days he published various contributions on surgical topics. He was keenly interested in hunting, and had exceptional knowledge of training horses. He is survived by his widow.

Professor LAIMI LEIDENIUS died towards the close of last year at the age of 61; she was professor of obstetrics at the University of Helsingfors. The death is also announced of Dr. IZER SOLOMON at the age of 58; he was radiologist to the Saint-Antoine Hospital, Paris, and a pioneer in the field of medical radiology.

Dr. ARTHUR VALLE, secretary of the faculty of medicine at Laval University, Quebec, a distinguished French-Canadian physician, died on January 8 in the same house in which he was born fifty-six years ago.

The following well-known foreign medical men have recently died: Dr. EMIL GRUNERT, a prominent Dresden surgeon, aged 64; Dr. LIBERMAN, professor of ophthalmology at the Royal Hungarian Pazmany University of Budapest; Professor MASSIMILIANO GORTAN, an eminent radiologist of Trieste, from cancer of the lung attributed to *x* rays, aged 65; Dr. OTTO KRUMMACHER, emeritus professor of physiology at Munich, aged 74; Dr. LOUKA RISTITSCH, a prominent Belgrade dermatologist; and Dr. JOHANNES LANGE, professor of psychiatry at Breslau, aged 48.

Universities and Colleges

UNIVERSITY OF OXFORD

At a Congregation held on January 19 the following medical degrees were conferred:

B.M.—S. Durham, J. E. Duffield.

UNIVERSITY OF CAMBRIDGE

Mrs. Muriel Elaine Adair, Ph.D., of Girton College, has been re-elected John Lucas Walker student for one year from October 1, 1938; and O. M. Solandt, M.D.Toronto, has been elected to a second John Lucas Walker studentship for three years from January 1, 1939. Marie Jahoda, Ph.D.Vienna, has been appointed to the Pinsent-Darwin studentship for one year from January 1, 1939.

At a Congregation held on January 21 the degree of Master of Arts was conferred upon Wilhelm Siegmund Feldberg, M.D.Berlin, university lecturer in physiology.

D. J. Bell, M.A., has been reappointed University Lecturer in Biochemistry for three years from February 1, 1939. The Benn W. Levy Studentship in Biochemistry is vacant, and applications should be addressed to the Professor, Sir F. G. Hopkins, F.R.S., at the School of Biochemistry before February 4.

A meeting will be held in the Regent House on Wednesday, February 8, at 5.30 p.m., at which Earl Winterton and Professor A. V. Hill, F.R.S., will speak on behalf of the Society for the Protection of Science and Learning.

At a Congregation held on January 23 the following medical degrees were conferred:

M.B., B.CHIR.—*E. P. Jowett, *W. R. Gavin, *R. H. H. Williams, *J. Watson, *G. H. Evans, *E. S. Dismorr, *E. W. Somerville, *C. W. C. Gough, *C. J. Rooke, *R. C. H. Tripp, *M. McC. Wilson, H. L. Porter, A. G. H. Clay, J. Clutton-Brock, A. L. Phillips, B. M. Wright, J. R. Bignall, B. R. Bray, M. E. Moore, J. M. Wilkin, G. A. Fowler, G. C. Pritchard, D. Russell-Davis, C. H. C. Dent, T. G. S. James.

M.B.—C. E. Elliott, R. G. Bickford.

* By proxy.

UNIVERSITY OF LONDON

UNIVERSITY COLLEGE

Dr. L. Young will deliver a course of three lectures on "Animal Detoxication Mechanism" at University College, Gower Street, W.C., on Mondays, February 27 and March 6 and 13, at 5 p.m. The lectures are open to the public without fee or ticket.

UNIVERSITY OF LEEDS

At a Congregation held on January 17 the honorary degree of D.Sc. was conferred on Professor J. S. B. Stopford, F.R.S., Vice-Chancellor and Professor of Experimental Neurology, University of Manchester.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners at the examination indicated:

HYGIENE.—Beryl Badham (with distinction), D. G. Jarman.

The following candidates have satisfied the examiners:

D.P.H.—*Part II:* Jennet Evans, Anne E. M. Herbert, Mary M. M. Llewellyn.

The Services

COLONEL COMMANDANT, R.A.M.C.

The King has approved the appointment of Major-General R. S. Hannay, C.B., C.M.G., D.S.O., retired pay, late R.A.M.C., as Colonel Commandant, Royal Army Medical Corps, as from June 8, in succession to Major-General D. J. Collins, C.B., C.M.G., retired pay, who attains the age limit for the appointment on that date.

NAVAL COMPASSIONATE FUND

At the quarterly meeting of the directors of the Naval Medical Compassionate Fund, held on January 20, Surgeon Vice-Admiral P. T. Nicholls, C.B., K.H.P., Medical Director-General of the Navy, in the chair, the sum of £126 10s. was distributed among the several applicants.

No. 2.

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 14, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1938 in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-38 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	43	4	15	1	—	41	8	7	—	3		
Deaths		1	2				2	—				
Diphtheria	1,186	118	232	44	21	1,659	179	20	75	59	1,263	179
Deaths	32	4	6	1	1	44	3	9	7	—		
Dysentery	38	9	15		—	288	65	122		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	1	1	—		—	4	—	—		—		
Deaths		—					1					
Enteric (typhoid and paratyphoid) fever	21	3	3	11	3	29	3	1	5	—	23	
Deaths	4	—	—	—	—	1	—	3	—	—		
Erysipelas			75	5	5			75	15	2		
Deaths		—					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	52	12	11	9	2	45	13	6	2	3		
Measles		21	35		3			1,786		582		
Deaths	3	—	—	—	—	44	9	13	1	11		
Ophthalmia neonatorum	102	11	29		2	92	7	25		—		
Deaths												
Pneumonia, influenzal*	1,793	185	81	18	69	1,647	159	21	2	11	1,726	224
Deaths (from influenza)	214	19	35	6	7	91	15	11	1	4		
Pneumonia, primary			421	28				344	12			
Deaths		28		31	24		31		20	3		
Polio-encephalitis, acute	—	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	17	3	—	1	1	8	2	—		—		
Deaths		—					—					
Puerperal fever	2†	2	17	1		1†	1	19	3	—		
Deaths		—					—					
Puerperal pyrexia	174	8	19		5	186	25	17		—		
Deaths												
Relapsing fever	1	—			—	—	—	—		—		
Deaths						—	—	—				
Scarlet fever	1,565	99	298	48	80	2,289	136	509	83	72	2,294	233
Deaths	3	—	2	—	—	6	2	2	—	2		
Small-pox	1	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—	—	—	—	—	—		
Whooping-cough		242	778		20			90		5		
Deaths	14	3	14	2	2	23	6	—	1	—		
Deaths (0-1 year)	482	79	65	37	38	529	106	86	29	32		
Infant mortality rate (per 1,000 live births)	73	64				89	88					
Deaths (excluding stillbirths)	6,890	1,302	949	318	233	6,147	1,213	860	249	210		
Annual death rate (per 1,000 persons living)	16.9	16.6	19.3	21.4	20.7	15.2	15.3	17.6	16.8	18.6		
Live births	6,596	1,120	911	389	252	6,668	1,326	918	307	252		
Annual rate per 1,000 persons living	16.2	14.3	18.6	26.2	22.3	16.4	16.7	18.7	20.7	22.3		
Stillbirths	263	36	36			259	30					
Rate per 1,000 total births (including stillborn)	38	31				37	22					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

EPIDEMIOLOGICAL NOTES

Scarlet Fever in Europe and the United States in 1938

According to the provisional data published by the *Weekly Epidemiological Record* of the Health Section of the Secretariat of the League of Nations the incidence of scarlet fever in the last two months of 1938 was lower than during the corresponding period in 1937 in most European countries, with the exception of Sweden and Switzerland, and in the United States of America. In England and Wales the number of cases recorded in each four-week period since July was lower than those in the corresponding periods of 1937 and below the median value for 1926–36 for the same period of the year. The yearly notifications since 1934 have been 152,069; 120,456; 104,862; 95,735; and 99,392 (provisional figure for 1938); and the apparent case-fatality rate for the years 1934–6 was approximately 0.53 per cent. The maximum seasonal incidence was reached between October 23 and November 5, six weeks earlier than the maximum in Germany, which took place between December 4 and 17. As in England and Wales notifications since July were lower than in the corresponding periods in 1936 and 1937. In 1936 a total of 125,679 cases was notified; in 1937, 117,544; and for the first fifty-one weeks of 1938, 112,267. The apparent case-fatality rate for 1934–6 was 0.81 per cent. In the United States of America during the four weeks ended December 3 14,007 cases of scarlet fever were recorded, the lowest number for this period for the last ten years. The total notifications recorded up to December 10 was 175,202, compared with 209,505 in the corresponding period of 1937.

Influenza and General Mortality, December and January

A seasonal increase in influenza and general mortality has been recorded in the 126 great towns of England and Wales in the last month of 1938 and the first two weeks of January, 1939, while foci of influenza have been reported in Ireland, Hungary, and Switzerland. During the four weeks ended January 14 the number of deaths ascribed to influenza in the 126 great towns was 41, 89, 144, and 214 respectively, while general death rates were 13.2 per 1,000, 15.1 per 1,000, 16 per 1,000, and 16.9 per 1,000. The rise in mortality during these four weeks was particularly marked in the towns of the south-western and northern districts; in Liverpool during the last four weeks deaths from influenza have been 10, 13, 32, and 25 respectively, and in Manchester 1, 3, 6, and 20 respectively. Judging from the number of deaths influenza has been later in appearance and milder in London; the deaths recorded for the last four weeks being 1, 8, 3, and 19 respectively.

In the United States the incidence of influenza in November, 1938, was higher than for the same month of the three preceding years; in that period 4,905 cases were reported, compared with 4,495 in 1937, 3,650 in 1936, and 3,359 in 1935. In the States of the Rocky Mountains and of the South Atlantic, and in the south-west of the central group of States, the incidence during this period of the year was considerably higher than the median value for the 1933–7 period.

In Hungary the number of complicated cases of influenza rose from 50 in the first week of the year to 170 in the second week for the whole country, of which 14 and 78 respectively occurred in Budapest.

Typhoid

During the week under review 2 cases of typhoid fever were notified in East Ham and 3 cases in West Ham. At the time of going to press a total of 46 cases has been reported in these boroughs, with 6 deaths. There have been no additional cases since these notes were written last week.

Dr. Richard P. Strong, professor of tropical medicine at Harvard Medical School since the founding of this department in 1913, has retired from active practice and become professor emeritus. He has been succeeded by Dr. John Gordon of Chicago.

VITAL STATISTICS, ENGLAND AND WALES, 1938

We are indebted to the Registrar-General for the following statement regarding the provisional birth rates and death rates, and the rates of infantile mortality, in England and Wales and in certain parts of the country during 1938. The statement is issued for the information of medical officers of health.

ENGLAND AND WALES

Birth Rate, Death Rate, and Infant Mortality Rate for the Year 1938 (Provisional Figures)

	Rate per 1,000 Resident Population		Deaths under 1 year per 1,000 Registered Live Births
	Live Births	Deaths (Crude Rates)	
England and Wales	15.1	11.6	53
126 county boroughs and great towns, including London	15.1	11.7	57
148 smaller towns with estimated resident populations of from 25,000 to 50,000 at the 1931 Census	15.6	11.2	51
London (administrative county)	13.4	11.3	57

Note.—The birth and death rates for England and Wales as a whole are calculated on the estimated mid-1938 population, but those for the towns' aggregates and for London are calculated on the estimated mid-1937 populations.

The birth rate for 1938 is 0.7 above that for 1933, which was the lowest recorded. For the intervening years the rates have been: 1934, 14.8; 1935, 14.7; 1936, 14.8; 1937, 14.9.

The crude death rate is 0.8 below that for 1937, and with the exception of 1930 (11.4) no lower rate is on record.

The infant mortality is the lowest ever recorded, being 5 below that for 1937 and 4 below that of 1935, the previous lowest record.

Medical News

The Hunterian Society will hold a banquet to commemorate the 211th anniversary of the birth of John Hunter, at the May Fair Hotel, Berkeley Street, W., on Thursday, February 9, at 7.30 p.m.

A scientific meeting of the Association of Clinical Pathologists will be held at the National Hospital, Queen Square, W.C., on Saturday, February 4. At 9.30 a.m. there will be a discussion on "The Diagnosis and Treatment of Streptococcal and Pneumococcal Infections," in which the following speakers will take part: Dr. V. D. Allison, the grouping and typing of streptococci; Dr. R. M. Fry, streptococci in relation to puerperal fever; Dr. A. G. Signy, streptococcal infections in infants; Dr. F. E. Camps, epidemiology of streptococcal infections, with special reference to scarlet fever; Dr. Sinclair Miller, streptococci in relation to rheumatic infections; and Dr. L. E. H. Whitby, the treatment of streptococcal and pneumococcal infections. Dr. N. Hamilton Fairley will discuss methaemalbumin (pseudo-methaemoglobin), its synthesis and clinical significance, and Dr. E. R. Elkan will describe the xenopus pregnancy test. In the afternoon there will be laboratory demonstrations, and the annual general meeting will be held after tea.

The programme of the one hundred and eighth session of the Harveian Society of London has been arranged as follows: February 9, clinical evening. March 9, Harveian Lecture by Mr. A. Tudor Edwards, "Modern Principles of Treatment in Bronchiectasis." April 20, Dr. D. Evan Bedford, "The Pulse." May 11, Mr. L. R. Broster, "Recent Advances in the Surgery of the Adrenal Cortex." June 8, Buckston Browne annual banquet. July 15, visit to film studio. October 13, presidential address by Dr. A. D. Morris. November 10, Professor E. C. Dodds, "Hormones." December 15, medical films. January 12, 1940, annual general meeting. With the exception of the Buckston Browne annual banquet, which is to be held at the Connaught Rooms, Great Queen Street, Kingsway, W.C., at 7.30 p.m., and the summer meeting on July 15, all meetings are to be held at 26, Portland Place, W., at 8.30 p.m.

The Society for the Protection of Science and Learning (formerly the Academic Assistance Council) will hold a public meeting on Monday, February 6, at 8.15 p.m., in the Great Hall, University College, Gower Street, London, W.C., for the purpose of launching a national appeal for funds for the work being done on behalf of academic refugees. The Archbishop of York will take the chair, and the speakers will be the Right Hon. Sir Samuel Hoare, the Marquess of Reading, and Sir Peter Chalmers Mitchell.

A postgraduate course in hygiene and bacteriology will be held at Bologna University from April 1 to May 31. Further information can be obtained from the Segretaria della Universita, Via Zamboni 33, Bologna.

The issue of *La Riforma Medica* for November 26, 1938, contains an account of the proceedings of the sixteenth congress of the Italian Society of Paediatrics, held at Genoa on September 15, when the subjects for discussion were meningitis with clear fluid, excluding tuberculous meningitis, prophylaxis and treatment of acute nutritional disorders in the infant, and physical education and sport in school children.

The King has given Professor Arthur Frederick Bernard Shaw, M.D., F.R.C.P.I., authority to wear the Insignia of Commander of the Order of the Nile, conferred upon him by the King of Egypt in recognition of valuable services rendered by him as Professor of Pathology in the Egyptian University, Cairo, on resignation of that chair.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL, Aitiology Westcent, London.*

SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Diet in Intestinal Atony

"S. A." has a patient who has twice been operated upon for intestinal obstruction. He would be glad to know what foodstuffs—arranged, if possible, in order of their gas-producing properties—are most apt to cause flatulence, a condition from which the patient suffers rather markedly. He would also like to know what others have found from experience to be the best drugs for intestinal atony.

Tapeworm

"X. Y. Z." writes: I have a woman patient with a tapeworm (*Bothriocephalus latus*). The treatment employed has been: (1) starvation as a preliminary; (2) copious alkaline drinks to remove mucus; and (3) ext. filicis liq. ♏ 90 to ♏ 120 in emulsion. On the several occasions this has been given there was prompt evacuation of the worm minus the head. Can anyone suggest an effective method of dealing with it?

Spasmodic Torticollis

"ANXIOUS" asks for suggestions as to the treatment of a case of spasmodic torticollis of nine months' duration in a man aged 60. Tonic spasms of the right trapezius accompanied by tonico-clonic contractions of the left sterno-mastoid, in which the right sterno-mastoid seems also involved to a lesser degree, cause almost continuous uncontrollable and violent jerking movements of the head. Sedatives appear to aggravate the condition.

Treatment of Cracked or Sore Nipples

Mr. R. MAXWELL SAVAGE, B.A., F.I.C. (Chief Chemist, S. Maw, Son and Sons Ltd.), writes: In your issue of December 24, 1938 (p. 1350), Dr. J. Walker writes of Wansbrough's nipple shield. These shields were brought to my notice several years ago, and I can confirm from experiment that lead is to be found in milk left in contact with the shields. To those who, like Dr. Walker, enjoy a full knowledge of this action, this is just what is wanted, but inquiries have shown that not everyone is aware that the shields work by acting as a source of lead lactate, and we have felt some uneasiness about the appliance. For example, recently it was found that the matron of a large maternity hospital regarded the shields as purely mechanical. I have no knowledge of any cases in which lead poisoning of the infant has resulted, nor do they seem likely when the shields are used by fully informed persons who, as Dr. Walker remarks, take care that "the nipple is carefully cleansed after removal of the shield," but the supply of lead lactate is inversely proportional to the cleanliness of the user, since fresh milk contains no lactic acid. If a revival of this old device is to be experienced is it likely to cause trouble in the hands of a not-too-clean mother in her own home? Any experience in this connexion would be welcomed as a basis for such action as a supplier can take, for with an appliance which is "almost forgotten" there is a responsibility to see that knowledge of its proper use revives with it, and is passed so far as possible along the line to the ultimate user.

LETTERS, NOTES, ETC.

Medicine Marches On

The "March of Time" films of various aspects of contemporary life are well known, and a recent addition entitled "Men of Medicine" proves an effective antidote to "The Citadel." Within the short period of ten minutes one is given quite a clear idea of the prolonged and elaborate training which goes to make a doctor, and more than a suggestion of the historical forces that are behind him. If we were to be hypercritical we might suggest that the American student is apparently not taught that inspection precedes palpation, to judge from the way "Dr. Gibson," the hero of the film, diagnoses his first case of appendicitis in practice. We wonder, too, whether he really needed sixty instruments for an appendicectomy. The problems of "socialized medicine" are introduced by some of the protagonists in the modern American scene, among them being Dr. Morris Fishbein, the Editor of the *Journal of the American Medical Association.*

Circumcision

Dr. T. GERALD GARRY (Folkestone) writes: It may interest correspondents who periodically discuss circumcision in the pages of the *Journal* to know that I have fully treated the history and origin of this strange tribal mutilation in my book *African Doctor,* just published by J. Gifford, Ltd.

Corrigendum

In the article on anaesthesia in thoracic surgery by Dr. J. T. Hunter (*Journal,* January 21, p. 102) there appears the following statement: "Magill (1936a) describes a modification of the Howard Jones technique, using procaine 1 in 1,500. . . ." Messrs. Ciba Limited point out that the solution used by Dr. Magill was *percaine,* 1 in 1,500. It was, of course, for this solution that the technique was originally described by the late Dr. Howard Jones.